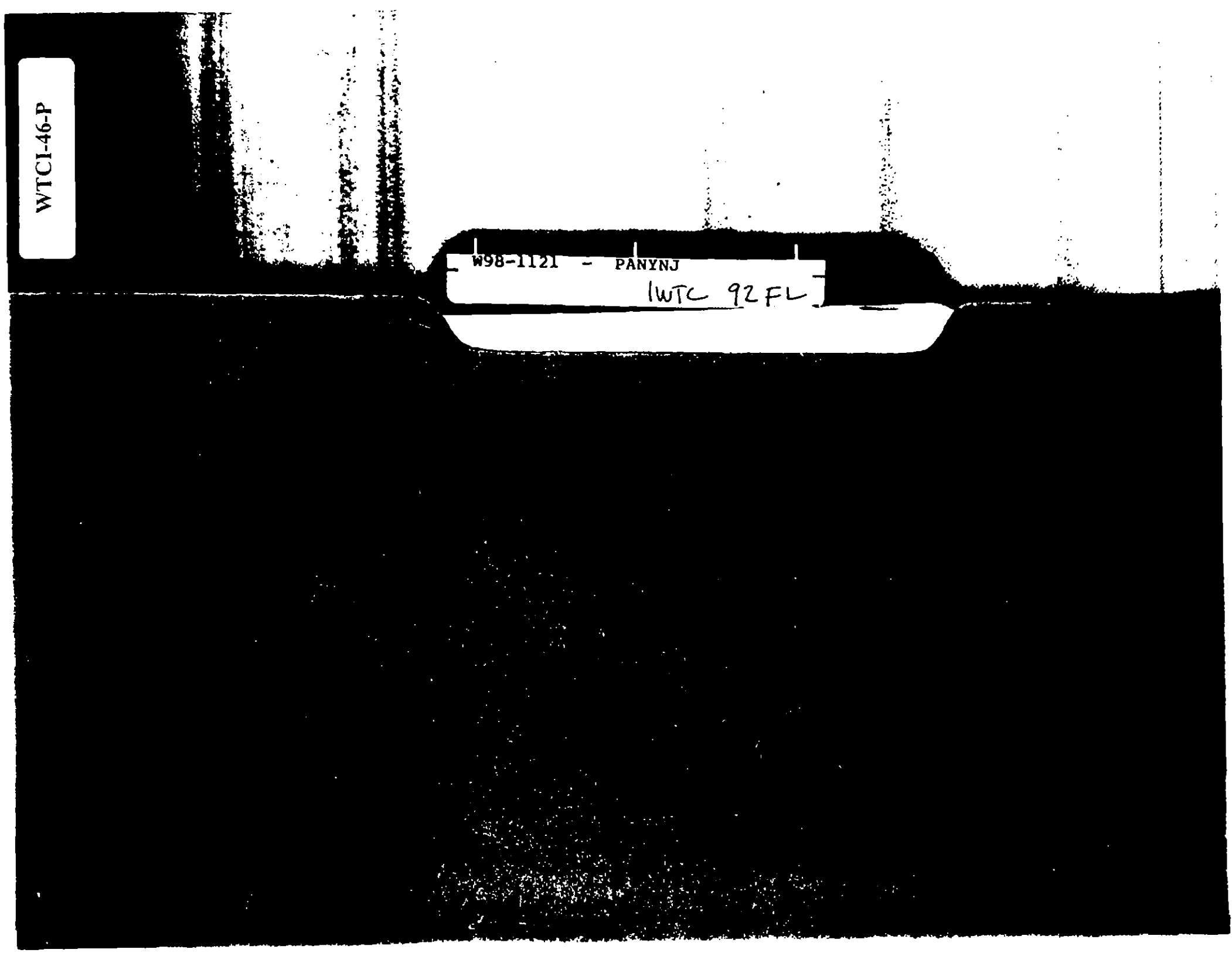

WTCI-46-P
W98-1121 - PANYNJ
1WTC 92FL

Quality Assurance Division
Design Standards

TAA No. W98-1171 (1) Charge Code:

Tenant: PANYNJ

REVIEW STATUS

Submission No. & Date	Response To	Coordinator's Initial	Memo Date	Approval Date	Facility Rider	Outstanding Comments	Remarks/Status	DWG/SPEC Location
01/2/18/98	-	SS	3/2/98	-	A	7		XXX11-B/3
2(3.23.98)	A	TCM	5/11/98	3/23/98	B	5	approval subject to	XXX1-C/1
3(7.28.98)	B	TCM	8/6/98	✓		1	"	"
4(8.24.98)	C	KN	8.31.98	8.31.98		0	APPROVED FOR CONSTRUCTION	—" —.

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY

M E M O R A N D U M

To: Ms. Teresa Koebel, Manager, World Trade Project Management
From: C. John Lin, P.E.
Date: August 31, 1998
Subject: **WTC - ALTERATION APPLICATION W-981121 - PANYNJ - 1 WTC, 92ND FLOOR - CORRIDOR AND LOBBY UPGRADE**

Reference: Review Request dated 8/17/98

Copy To:

J. Castaldo	T. O'Connor	Job Folder
A. Fadavi	R. Rafferty	Chrono Folder
J. Napolitano	A. Reiss	
K. Piatt		

A review of the material listed below and submitted with the referenced request has been made.

The previous recommendation that approval to proceed with construction be given subject to..., has been changed to recommending that **approval to proceed with construction** be given.

There are no comments.

Drawings: Specifications:

REMARKS: 1) Since there were no new drawings submitted, the previous list of drawing recommended for approval remains the same.

2) This memorandum was transmitted to the Facility via OA on August 31, 1998.

for Ron Pisapia
C. John Lin, P.E.
Manager
Quality Assurance Division

I.D.: W98-1121-004
KN/al

Reviewer:
K. Narsule, Fire Protection and Coordinator.

THE [illegible]RT AUTHORITY OF NEW YORK AND N[illegible] JERSEY
TENAN[illegible] ALTERATION APPLICATION REVIEW REQUEST

XAP 9/8

DISTRIBUTION		
No	To	Facility
4	QAD	51 N
1	D. Warren	PATC ZIP43
1	S.P. Chiao	88-S
1	G. Daly	88-S
2	S. Batra	2WTC 37FL
1	C. Bonacci	2WTC 35FL

Facility One FLR 92nd TAA No. 981121 Date 8/24/98

Application / Tenant Corridor upgrade

Consultant Swanke

Estimated Cost 121,000 Submittal No. Three

Description of Work Corridor Upgrade

Please review the attached (revised) application and send comments to:

Name Jennifer Richardson

Location: 1 WTC - 88 - South Phone: 435- 2014

8/31/98 DUE DATE

OFFICE COPY

DESIGN DISCIPLINES

- ☐ Architectural
- ☐ Egress Analysis
- ☐ Structural
- ☐ HVAC
- ☐ Plumbing
- ☐ Sprinkler
- ☐ Electrical
- ☐ Utility > 600 V
- ☐ Civil
- ☐ Geotechnical
- ☐ Environmental
- ☐ Fueling
- ☐ Radio Freq. Coord.
- ☐ Corrosion Protection
- ☐ Elevator / Escalator
- ☐ Other_____

ATTACHMENTS

- ☐ Document List
- ☐ Contract Drawings
- ☑ Contract Specifications
- ☐ Tenant Response
- ☐ Computations
- ☐ Reports
- ☐ Catalog Cuts
- ☐ Other

DESCRIPTION

Please review ASAP.
Specification change only.

Special Instructions

[illegible]TY OF N.Y. & N.J.
[illegible]ERING DEPT. QUALITY ASSURANCE DIV.
DESIGN STANDARDS
AUG 27 1998
W98-1121 (4)
RECEIVED
ALTERATIONS APPLICATION
TENANT CONSTRUCTION REVIEW UNIT

Copy To: ~~G. Geete~~, J. Napolitano, ~~E. Monteverde~~, N. Seliga
J. Richardson (Proj. Mgr.)

Signature

form:gertler/TAA/review revised 3/3/98

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY

M E M O R A N D U M

To: Ms. Teresa Koebel, Manager, World Trade Project Management
From: C. John Lin, P.E.
Date: August 6, 1998
Subject: **WTC - ALTERATION APPLICATION W-981121 - PANYNJ - 1 WTC, 92ND FLOOR - CORRIDOR AND LOBBY UPGRADE**

Reference: Review Request dated 7/28/98

Copy To: J. Castaldo, A. Fadavi, K. Piatt, J. Napolitano, T. O'Connor, R. Rafferty, Job Folder, Chrono Folder

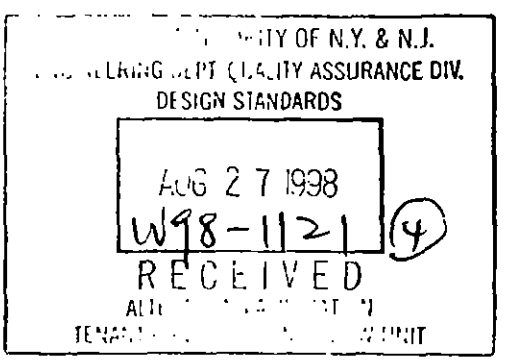
A review of the material submitted with the referenced request has been made.

The previous recommendation of approval to proceed with construction remains **unchanged** subject to the **submission** of the items listed below being **revised** in accordance with the **one (1) requirement** listed on the attached rider.

Drawings:

REMARKS: 1) See the attachment for a revised list of drawings recommended for approval.

2) This memorandum was transmitted to the Facility via OA on August 6, 1998.



C. John Lin, P.E.
Manager
Quality Assurance Division

I.D.: W98-1121-003
TSM/al
att.

Reviewers:
T. Santa Maria, Coordinator and Electrical; Z. Goldenberg, Mechanical; D. Luey, Fire Protection.

OFFICE COPY

ATTACHMENT

ALTERATION APPLICATION W-971121

Subject to compliance with the requirements listed in this memorandum's rider, the following is a revised list of drawings recommended for approval:

Drawing		
T-1	dated	3/16/98
T-2	dated	3/16/98
A-1	dated	3/16/98
A-2	dated	3/16/98
A-3	**revised**	**4/21/98**
E192K	dated	3/16/98
E192C	dated	3/16/98
M-1.0	dated	3/16/98
M-1.01	**revised**	**7/23/98**
SP-102	dated	2/13/98

RIDER

ALTERATION APPLICATION W-981121

FIRE PROTECTION

1. *Technical Specification 15300 - Sprinkler, Subsection 1.12B. Revise* last sentence to read "...on the 92nd Floor of 2 WTC is 96.1 psig."

080698

SWANKE HAYDEN CONNELL ARCHITECTS

Transmittal

Re: PANY 92ND. FLOOR 15300 Spec. 5566-D | Job No. | Date: 8-17-98

To: MS. JENNIFER RICHARDSON - PANY & NJ. TENANT PROJECT MANAGEMENT | Attention

Address: ONE WTC. 88th. FLOOR SOUTH N.Y., NY 10048

Copy to: MR. PHILIP CEBULSKI

☐ Prints ☐ Sepia ☐ Shop Drawings ☐ Other
☐ Specifications ☐ Mechanical Art Work ☐ Clears

☐ Federal Express ☐ Express Mail ☐ U.S. Mail ☐ Our Messenger ☐ Your Messenger

No. of Copies	Drawing No.	Title	Dated	Revised
3		SPEC. SECTION 15300 - SPRINKLER		
		REVISED. 8-17-98.		

PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPT. QUALITY ASSURANCE DIV.
DESIGN STANDARDS
AUG 27 1998
W98-1121 (4)
RECEIVED

Remarks: REVISED SECTION 1.12 PARAGRAPH B LAST SENTANCE TO READ "ON THE 92ND FLOOR OF 2 WTC IS 96.1 PSIG." AS PER YOUR REQUEST.

THANK YOU:

If items listed are not received, please notify | Signature: Patricia Kancir

OFFICE COPY

Swanke Hayden Connell Ltd.
Swanke Hayden Connell & Partners LLP
295 Lafayette Street, New York, New York 10012
212 226 9696

Cosentini Associates LLP
Consulting Engineers

SECTION 15300

SPRINKLER

1.01 REFERENCE TO GENERAL CONDITIONS

A. Perform the work in accordance with the requirements of the general conditions.

1.02 GENERAL

A. Coordinate work with all other trades and existing conditions of the job site and maintain required ceiling heights and space conditions.

B. Provide all materials, equipment, services, labor and tests necessary for complete execution of the plumbing work in accordance with the governing codes and authorities.

1.03 CODES, PERMITS, FILING, APPROVALS AND INSPECTIONS

A. All work shall meet or exceed the latest requirements of NFPA-13 and all National, State, County, Municipal and other Authorities exercising jurisdiction over construction work at the project.

B. Prepare and submit all drawings and documents required for approval agencies.

C. Perform all filing and obtain all approvals required by agencies having jurisdiction.

D. Obtain, and pay for all fees and costs for filing, approvals, permits; acceptance and inspection certificates.

E. Obtain drawings and data of the existing building sprinkler installation, in order to expedite filing and approval. Include this data with the filing and approval submissions.

OFFICE COPY

ENGINEERING
DESIGN STANDARDS
AUG 27
W98-1121 (4)
RECEIVED
ALTERATIONS APPLICA
TENANT CONSTRUCTION

1.04 **GUARANTEES AND CERTIFICATIONS**

A. All work shall be guaranteed to be free from leaks or defects. Any defective materials or workmanship, as well as damage to the work of all trades resulting from same shall be replaced or repaired as directed for the duration of stipulated guaranteed periods. The duration of guarantee periods shall be one year.

1.05 **SHOP DRAWINGS AND OTHER INFORMATION REQUIRED**

A. Prior to assembling or installing the work, the following shall be submitted for approval:

1. Scale drawings with reflected ceiling layouts and floors plans, dimensioned location of each sprinkler head, all piping with sizes, elevations, valves, equipment and appropriate indication of coordination with other trades. Show all existing sprinkler system piping and heads.

2. Hydraulic calculations (Provide).

1.06 **CONNECTIONS TO EXISTING WORK AND ALTERATION**

A. Connect new work to existing work in neat and approved manner. Restore existing work disturbed to original condition.

B. Provide caps, plugs and outlets as required on existing piping.

C. Remove and/or relocate existing and other work as required by alteration, as noted or as directed. All removed existing work shall be disposed of, or salvaged and removed to designated areas as directed.

D. Coordinate with all other trades existing conditions at the job site. Maintain required ceiling heights and space conditions. Verify all piping locations with existing conditions.

E. The existing plumbing system shall be left in perfect working order upon completion of all new work.

F. The Contractor shall request sprinkler shutdowns 48 hours in advance by notifying the PA/WTC Construction Inspector who will coordinate the shutdown. The Contractor shall insure that drainage will be discharged to an approved location or receptacle without causing damage to other work or property. All costs resulting from temporary shut-downs shall be borne by this contractor.

1.07 **MISCELLANEOUS**

A. Provide as part of the work:-

- Hangers and supports for piping.
- Scaffolding, rigging, hoisting.
- Cutting and patching.
- Rubbish removal.
- Sleeves and openings, core drilling existing slabs.
- Caulking, packing and filling of sleeves and openings.
- Shop drawings with hydraulic calculations.
- Record as-built drawings.
- Obtaining all required permits, approvals and inspection certificates.
- Guarantee all work, labor and materials for one year following date of acceptance.
- Operating and maintenance instructions.
- Verify existing conditions.
- Spare parts and tools.
- Tests: operating, performance and code required tests.
- Protection of work during construction.
- Coordination with other trades.
- Cleaning.
- Identification: valve tags, valve tag schedules, piping identification.
- Compliance with materials and equipment division .
- Unit prices.
- Samples.
- Ladders: - Steel ladders for access to valves located over 7'-0" above floor.

1.08 GENERAL INSTALLATION

A. The sprinkler drawings are an interpretation of the information included in this specification, and are given as a guide only, and they therefore do not relieve this contractor from providing all work and equipment necessary to complete the installation according to the requirements. The number and spacing of sprinkler heads, spacing and size of pipe, location and number of valves, method of draining lines, and all other details and work shall be as required by the Owner's Underwriters, N.F.P.A. and all other governing authorities.

B. The sprinkler heads in all areas are to be installed on a true axis line in both directions "with a maximum deviation from the axis line of ½" plus or minus. At the completion of the installation, if any heads are found to exceed the above mentioned tolerance, same shall be removed and reinstalled by this contractor.

C. The arrangement, positions and connections of pipes, drains, valves, etc., shown on the drawings shall be take as a close approximation and while they shall be followed as closely as possible, the right is reserved by the architect to change the locations, to accommodate any conditions which may arise during the progress of the work without additional compensation to this contractor for such changes, provided that the changes are requested prior to the installation of this contractor's work. The responsibility for accurately laying out the work rests with this contractor. Should it be found that any of his work is so laid out that interferences will occur he shall so report that to the architect.

D. Provide all sprinkler heads and work in strict accordance with approved shop drawings. The architect reserves the right to reject any and all work not in accordance with the approved shop drawings.

1.09 SPRINKLER HEADS

A In all finished areas, sprinkler heads shall be Reliable Automatic Sprinkler Co., Model G4 "Concealer," BS&A 587-75-SA, with a 165°F temperature rating. The cover plate of heads must be chrome plated, not factory painted white. For 1, 2, and 5 WTC, orifice size shall be ½", in 4 WTC orifice size shall be 7/16".

1.10 PIPE AND FITTING MATERIALS

A. All wet system sprinkler piping shall be standard weight, Schedule 40 black steel pipe, conforming to ASTM A795/A53 with threaded cast iron fittings, Class 125, or malleable iron fittings, Class 150. Schedule 10 pipes, grooved piping, and mechanical grooved fittings are not permitted. Victaulic fittings are not permitted to be used for size 3 in. and under unless otherwise approved.

1.11 SIGNS

A. Provide all designating signs as required by the agencies having jurisdiction.

1.12 TESTS

A. Perform all required tests in the manner prescribed by and to the satisfaction of the Owner's insurance underwriters, and all authorities having jurisdiction. Owner's representatives shall be present inspect tests. Obtain all required certificates of approval and pay any fees or costs in conjunction therewith.

B. Perform hydrostatic tests for all sections of the sprinkler piping systems installed under this Section, at not less than 200 psi pressure for two hours, or at 50 psi in excess of the maximum pressure, when the maximum pressure to be maintained in the system is in excess of 150 psi. The test pressure shall be read from a gauge located at the low elevation point of the individual system, or portion of the system being tested. The static pressure at the inlet of control valve on the 92nd floor of 2 WTC is 96.1 psig.

C. Before an application for final acceptance of the work will be considered, all tests required and deemed necessary to show proper execution of the work shall have been performed in the presence of the Owner's representative. Scheduling of all testing procedures shall be arranged to suit the convenience of the Owner's representative.

1.13 EXISTING SPRINKLER SYSTEM

A. Refurbish, relocate, modify existing sprinkler system.

B. Existing system shall be changed as required in accordance with the new alteration work.

C. Drain down existing piping to facilitate new work.

1.14 **NOTES**

A. Locations and type of new sprinkler heads are indicated. New piping with connections to existing system is not shown. Contractor shall provide all new piping with new connections to existing system and modify existing system as required.

B. Remove existing sprinkler heads as required. Removal and/or addition of sprinkler heads includes removal and/or addition or piping, fittings and all associated work.

C. Sprinkler piping layout and pipe sizes shall be determined by the contractor in accordance with the room layouts and final locations of lights, diffuses, grilles, etc. and final ceiling construction type and architectural features.

D. Utilize the existing sprinkler floor layout drawings and existing as-built conditions in conjunction with the new sprinkler work in order to provide an overall sprinkler installation compatible with the existing as-built conditions.

(1471-1.98\spklr.spc)

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY

M E M O R A N D U M

To: Ms. Teresa Koebel, Manager, World Trade Project Management
From: C. John Lin, P.E.
Date: August 6, 1998
Subject: **WTC - ALTERATION APPLICATION W-981121 - PANYNJ - 1 WTC, 92ND FLOOR - CORRIDOR AND LOBBY UPGRADE**

Reference: Review Request dated 7/28/98

Copy To: J. Castaldo, A. Fadavi, K. Piatt, J. Napolitano, T. O'Connor, R. Rafferty, Job Folder, Chrono Folder

A review of the material submitted with the referenced request has been made.

The previous recommendation of approval to proceed with construction remains **unchanged** subject to the **submission** of the items listed below being **revised** in accordance with the **one (1) requirement** listed on the attached rider.

Drawings:

REMARKS: 1) See the attachment for a revised list of drawings recommended for approval.

2) This memorandum was transmitted to the Facility via OA on August 6, 1998.

for Ron Pisapia
C. John Lin, P.E.
Manager
Quality Assurance Division

I.D.: W98-1121-003
TSM/al
att.

Reviewers:
T. Santa Maria, Coordinator and Electrical; Z. Goldenberg, Mechanical; D. Luey, Fire Protection.

RIDER

ALTERATION APPLICATION W-981121

FIRE PROTECTION

1. Technical Specification 15300 - Sprinkler, Subsection 1.12B. Revise last sentence to read "...on the 92nd Floor of 2 WTC is 96.1 psig."

080698

ATTACHMENT

ALTERATION APPLICATION W-971121

Subject to compliance with the requirements listed in this memorandum's rider, the following is a revised list of drawings recommended for approval:

Drawing		
T-1	dated	3/16/98
T-2	dated	3/16/98
A-1	dated	3/16/98
A-2	dated	3/16/98
A-3	**revised**	**4/21/98**
E192K	dated	3/16/98
E192C	dated	3/16/98
M-1.0	dated	3/16/98
M-1.01	**revised**	**7/23/98**
SP-102	dated	2/13/98

080698

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY
ENGINEERING DEPARTMENT - DESIGN DIVISION TAA REVIEW REQUEST

To: D. LUEY (Reviewer) Location: 7 4 S

From: QAD DESIGN STANDARDS Date: 7/28/98

TAA # W98-1121-003 (Submission #) Facility: 1 WTC/92

Tenant: PANYNJ Rec'd. Date: 7/28/98

Description of Work: CORRIDOR/LOBBY UPGRADE

Charge Code: W2-X-X-200.444

Review Disciplines

- [ ] Architectural
- [ ] Structural
- [ ] HVAC
- [ ] Plumbing
- [x] Fire Protection/ Sprinklers/Etc.
- [ ] Electrical/Metering
- [x] Utility> 600 V/ 5 KV
- [ ] Civil
- [ ] Geotechnical
- [ ] Environmental/Asbestos Abatem't
- [ ] Fueling
- [ ] Radio Frequency Coordination
- [ ] Corrosion Protection
- [ ] Elevator/Escalator
- [x] Traffic
- [ ] Other(specify)_____

Attachments

- [ ] Document List
- [x] Contract Drawings
- [x] Contract Specifications
- [x] Tenant Response
- [ ] Calculations
- [ ] Catalog Cuts
- [ ] Reports
- [ ] Certifications
- [ ] Previous Rider
- [ ] Other (specify)_____

Special Instructions

Reviewer Information

Name_____
Date started _____
Date completed _____
Review time(days) ___
New comments ___
Repeat comments ___

DUE DATE: 8/3/98

Please notify the COORDINATOR if you cannot complete the review by the due date.

Please review the attached submittal; FAX and send your written comments to the following COORDINATOR:

Name: T. SANTA MARIA Location: 51 N

Phone #:(212) 435-8609 FAX #: (212) 435-2069*

* If responding by fax, please advise coordinator in advance at telephone number indicated. (Note new fax number).

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
TENANT ALTERATION APPLICATION REVIEW REQUEST

PM 8/10
XAP 8/6

DISTRIBUTION		
No	To	Facility
(4)	QAD	51 N
1	D. Warren	PATC ZIP43
1	S.P. Chiao	88-S
1	G. Daly	88-S
2	S. Batra	2WTC 37FL
1	C. Bonacci	2WTC 35FL

Facility _____ FLR _____ TAA No. W98-112 Date 7/28/98

Application / Tenant World Trade - Corridor & Lobby upgrade

Consultant Swanke Hayden Connell

Estimated Cost $150,000 Submittal No. Three

Description of Work Corridor upgrade

Please review the attached (revised) application and send comments to:

Name: Jennifer Richardson

Location: 1 WTC - 88 - South Phone: 435-2014

8/5/98 DUE DATE

OFFICE COPY

DESIGN DISCIPLINES

- [x] Architectural
- [ ] Egress Analysis
- [x] Structural
- [x] HVAC
- [x] Plumbing
- [ ] Sprinkler
- [ ] Electrical
- [ ] Utility > 600 V
- [ ] Civil
- [ ] Geotechnical
- [ ] Environmental
- [ ] Fueling
- [ ] Radio Freq. Coord.
- [ ] Corrosion Protection
- [ ] Elevator / Escalator
- [ ] Other_____

ATTACHMENTS

- [x] Document List
- [ ] Contract Drawings
- [ ] Contract Specifications
- [x] Tenant Response
- [ ] Computations
- [ ] Reports
- [ ] Catalog Cuts
- [ ] Other

DESCRIPTION

THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPT. QUALITY ASSURANCE & DESIGN STANDARDS
JUL 28 1998
W98-112-1 (3)
RECEIVED
ALTERATIONS APPLICATION
TENANT CONSTRUCTION REVIEW UNIT

Special Instructions

Please review in 5 days
NO RTF

Copy To: ~~O. Ortiz~~, J. Napolitano, ~~E. Montoverde, N. Seliga~~
J. Richardson (Proj. Mgr.)

Signature

SWANKE HAYDEN CONNELL ARCHITECTS

295 Lafayette Street, New York, New York 10012
212 226 9696, Fax 212 219 0059

July 20, 1998

OFFICE COPY

Ms. Jennifer Richardson
Tenant Project Management Unit
One World Trade Center 88 South
New York, NY 10048

THE PORT AUTHORITY OF N.Y.
ENGINEERING DEPT. QUALITY ASSURANCE
DESIGN STANDARDS
JUL 28 1998
W98-1121 (3)
RECEIVED
ALTERATIONS APPLICATION
TENANT CONSTRUCTION REVIEW

Re: Response to ADA Upgrade Toilets
92nd . Floor-Base Building Project

Dear Ms. Richardson:

We are submitting herewith ten (10) sets of the revised documents. The revised documents have been signed and sealed by the Engineer and Architect of record who is licensed to practice in the State of New York. The latest revision number has been indicated on each drawing in the title box, each revision has been circled and the latest revision number has been indicated inside the triangle.

The following are our responses to your comments.

GENERAL

1. All design documents such as drawings, computations, and specifications shall be sealed and signed by the Architect or Engineer of Record licensed to practice in the State of New York.

All drawings are submitted in this package they are all sealed and signed. See enclosed drawing list.

ELECTRICAL

2. DRAWING E192C. The response to Comment 1 of the previous Rider is noted. Two (2) printouts of iso footcandle curves, Design File PA1 (EXHIBIT 1) and Design File PA2 (EXHIBIT 2) representing the Elevator Lobby and the Corridor, respectively, were submitted. Also submitted is a printout Design File PA2.des herein designated as EXHITIT 3) showing levels of illumination along the Corridor during normal conditions

a) EXHIBIT 3 shows an average illumination of 12.9 fc and a minimum of 2.07 fc but EXHIBIT 1 and EXHIBIT 2 show that the levels of illumination drops to zero (no levels of illumination are shown) between the emergency fixtures.

W:\1566\DOCS\RESPONSES\SHCA_PA_RESP 01 92ND FLR.DOC

Please clarify, and submit printout ot levels of illumination similar to EXHITIT 3, but under emergency condition with the average and minimum levels of illumination indicated.

Response to 2.a See enclosed calculations the footcandle levels do not drop to 0 they remain at 2.4 no additional curves indicate constant reading.

b) The levels of illumination submitted could not be verified since the following were not submitted, as requested in the previous Rider

i) Submit the photometric data for each type of emergency fixtures used, including a typical candlepower distribution curve for each. See Figure 10.3.

ii) Submit information and/or data used in calculating/verifying the levels of illumination

Response to 2.b See enclosed submissions of photometric data for each type of emergency fixture including typical candlepower, and distribution curve

c) On Drawing (E192C), show the specific type of fixtures to be used. The emergency fixtures are designated as B/B1 and A/A1. Please be specific.

Response to 2.c Drawing was corrected also enclosed is a catalogue cut of fixture intended to be used. Fixtures are designed for 120V on the lighting fixture list. Typical A-1 and B-1 fixtures are indicated on the plan. Emergency fixtures are indicated on the plan and the notes require all said fixtures to be wired for 120V . The A-1 and B-1 fixtures are those which are designated as Emergency fixtures.

d) EXHITIT 1 and EXHIBIT 2. Please indicate on the printout the following: Fixture type, manufacturer, lamp designation, volt and volt-ampere (e.g., type A1, Neoray Fenestra 202/bx, F403bxspx35GE, 120V, 80VA).

Response to 2.d See enclosed catalogue cut of the fixture types these were included with the printout.

e) EXHIBIT 1 and EXHIBIT 2. Please indicate on the printout all the computer input data used in calculating the levels of illumination. 8 ½ X 11 attached.

Response to 2.e See enclosed catalogue cut of the fixture types these were included with the printout.

MECHANICAL

3. Drawing M-1.01: Details of Methods of Hanging Ductwork. In this detail, specity the maximum distance between duct hangers as well as the minimum sizes of duct hanger straps in conformance with NYC Building Code RS 13-1, Section 2-1.1.2.3(a).(3) (4) and (5). Note that Section 2-1.1.2.3(a).(4) contains typographical error indicating the minimum hanger sizes as 1 inch by 1/18 inch instead of 1 inch by 1/8 inch. (Repeat comment)

Response to 3. Separation between duct hangers shall be 6 ft to 8 ft. Duct hanger straps shall be 1/8" thick, as per code RS 13-1.

FIRE PROTECTION

4. Drawing SP-102. Show all new and existing sprinkler piping and sizes in the area of work. See attached Drawing SP-9 (2 sheets). (Modified repeat comment).

Response to 4. We need as built drawings to show all existing piping and sizes in scope of work.

5. Drawing SP-102 Technical Specifications Division 15 (Sections 15300 and 15500) are missing. Please submit for review. (Modified repeat comment).

Response to 5. See enclosed sprinkler specifications.

Sincerely,

SWANKE HAYDEN CONNELL ARCHITECTS

Fabian Karcic,
Project Manager

cc: Mr. Napolitano, PANY&NJ

SWANKE HAYDEN CONNELL ARCHITE

Memorandum

Project Name and Address:	Project No:
Port Authority of NY and NJ One World Trade Center, 88th Fl. South New York, NY 10048	5566BC **Project Director/Manager:** Fabian Karcic **Client:** Port Authority **Subject:** 92nd Floor Corridor and Lobby upgrade

To	From	Date Prepared
Jennifer Richardson	Daniel Spanton	7-22-98

Note:

The following is a list of drawings and their latest revision date:

Dwg. #	Name	Rev. Date
T-1	- Title Sheet	- 3/16/98
T-2	- List of abbreviations, Index of drawings, dwg. conventions and Notes	- 3/16/98
A-1	- Demolition Plan, Legend, and notes	- 3/16/98
A-2	- Construction Plan, legend and notes	- 3/13/98
A-3	- Reflected ceiling plan, legend and notes	- 4/21/98
A-4	- Elevations, Partition types, and misc. details	- 4/24/98
A-5	- Door types, Misc. details, and Schedules	- 4/24/98
E192K	- 92nd floor demolition plan / symbol list	- 3/16/98
E192C	- 92nd floor construction plan (lighting)	- 3/16/98
M1.00	- 92nd floor demolition plan	- 3/16/98
M1.01	- 92nd new HVAC ductwork plan	- 7/23/98
SP102	- 92nd floor sprinkler plan	- 3/16/98

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cc: Fabian Karcic

PORT AUTHORITY OF ...
... DEPT QUALITY A...
DESIGN STANDARDS
JUL 28 1998
W98-1121 (3)
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ALTERATIONS APPLICATION
TENANT CONSTRUCTION REVIEW UNIT

W:\5566\DOCS\DWGLIST\1WTC-92LIST.DOC

Swanke Hayden Connell Ltd./Swanke Hayden Connell & Partners LLP
295 Lafayette Street, New York, New York 10012
212 226 9696, Fax 212 219 0059

Cosentini Associates LLP
Consulting Engineers

SECTION 15300

SPRINKLER

1.01 REFERENCE TO GENERAL CONDITIONS

A. Perform the work in accordance with the requirements of the general conditions.

1.02 GENERAL

A. Coordinate work with all other trades and existing conditions of the job site and maintain required ceiling heights and space conditions.

B. Provide all materials, equipment, services, labor and tests necessary for complete execution of the plumbing work in accordance with the governing codes and authorities.

1.03 CODES, PERMITS, FILING, APPROVALS AND INSPECTIONS

A. All work shall meet or exceed the latest requirements of NFPA-13 and all National, State, County, Municipal and other Authorities exercising jurisdiction over construction work at the project.

B. Prepare and submit all drawings and documents required for approval agencies.

C. Perform all filing and obtain all approvals required by agencies having jurisdiction.

D. Obtain, and pay for all fees and costs for filing, approvals, permits; acceptance and inspection certificates.

E. Obtain drawings and data of the existing building sprinkler installation, in order to expedite filing and approval. Include this data with the filing and approval submissions.

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PORT AUTHORITY (...
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1.04 GUARANTEES AND CERTIFICATIONS

A. All work shall be guaranteed to be free from leaks or defects. Any defective materials or workmanship, as well as damage to the work of all trades resulting from same shall be replaced or repaired as directed for the duration of stipulated guaranteed periods. The duration of guarantee periods shall be one year.

1.05 SHOP DRAWINGS AND OTHER INFORMATION REQUIRED

A. Prior to assembling or installing the work, the following shall be submitted for approval:

1. Scale drawings with reflected ceiling layouts and floors plans, dimensioned location of each sprinkler head, all piping with sizes, elevations, valves, equipment and appropriate indication of coordination with other trades. Show all existing sprinkler system piping and heads.

2. Hydraulic calculations (Provide).

1.06 CONNECTIONS TO EXISTING WORK AND ALTERATION

A. Connect new work to existing work in neat and approved manner. Restore existing work disturbed to original condition.

B. Provide caps, plugs and outlets as required on existing piping.

C. Remove and/or relocate existing and other work as required by alteration, as noted or as directed. All removed existing work shall be disposed of, or salvaged and removed to designated areas as directed.

D. Coordinate with all other trades existing conditions at the job site. Maintain required ceiling heights and space conditions. Verify all piping locations with existing conditions.

E. The existing plumbing system shall be left in perfect working order upon completion of all new work.

F. The Contractor shall request sprinkler shutdowns 48 hours in advance by notifying the PA/WTC Construction Inspector who will coordinate the shutdown. The Contractor shall insure that drainage will be discharged to an approved location or receptacle without causing damage to other work or property. All costs resulting from temporary shut-downs shall be borne by this contractor.

1.07 MISCELLANEOUS

A. Provide as part of the work:-

- Hangers and supports for piping.
- Scaffolding, rigging, hoisting.
- Cutting and patching.
- Rubbish removal.
- Sleeves and openings, core drilling existing slabs.
- Caulking, packing and filling of sleeves and openings.
- Shop drawings with hydraulic calculations.
- Record as-built drawings.
- Obtaining all required permits, approvals and inspection certificates.
- Guarantee all work, labor and materials for one year following date of acceptance.
- Operating and maintenance instructions.
- Verify existing conditions.
- Spare parts and tools.
- Tests: operating, performance and code required tests.
- Protection of work during construction.
- Coordination with other trades.
- Cleaning.
- Identification: valve tags, valve tag schedules, piping identification.
- Compliance with materials and equipment division .
- Unit prices.
- Samples.
- Ladders: - Steel ladders for access to valves located over 7'-0" above floor.

1.08 GENERAL INSTALLATION

A. The sprinkler drawings are an interpretation of the information included in this specification, and are given as a guide only, and they therefore do not relieve this contractor from providing all work and equipment necessary to complete the installation according to the requirements. The number and spacing of sprinkler heads, spacing and size of pipe, location and number of valves, method of draining lines, and all other details and work shall be as required by the Owner's Underwriters, N.F.P.A. and all other governing authorities.

B. The sprinkler heads in all areas are to be installed on a true axis line in both directions "with a maximum deviation from the axis line of ½" plus or minus. At the completion of the installation, if any heads are found to exceed the above mentioned tolerance, same shall be removed and reinstalled by this contractor.

C. The arrangement, positions and connections of pipes, drains, valves, etc., shown on the drawings shall be take as a close approximation and while they shall be followed as closely as possible, the right is reserved by the architect to change the locations, to accommodate any conditions which may arise during the progress of the work without additional compensation to this contractor for such changes, provided that the changes are requested prior to the installation of this contractor's work. The responsibility for accurately laying out the work rests with this contractor. Should it be found that any of his work is so laid out that interferences will occur he shall so report that to the architect.

D. Provide all sprinkler heads and work in strict accordance with approved shop drawings. The architect reserves the right to reject any and all work not in accordance with the approved shop drawings.

1.09 SPRINKLER HEADS

A. In all finished areas, sprinkler heads shall be Reliable Automatic Sprinkler Co., Model G4 "Concealer," BS&A 587-75-SA, with a 165°F temperature rating. The cover plate of heads must be chrome plated, not factory painted white. For 1, 2, and 5 WTC, orifice size shall be ½", in 4 WTC orifice size shall be 7/16".

1.10 PIPE AND FITTING MATERIALS

A. All wet system sprinkler piping shall be standard weight, Schedule 40 black steel pipe, conforming to ASTM A795/A53 with threaded cast iron fittings, Class 125, or malleable iron fittings, Class 150. Schedule 10 pipes, grooved piping, and mechanical grooved fittings are not permitted. Victaulic fittings are not permitted to be used for size 3 in. and under unless otherwise approved.

1.11 SIGNS

A. Provide all designating signs as required by the agencies having jurisdiction.

1.12 TESTS

A. Perform all required tests in the manner prescribed by and to the satisfaction of the Owner's insurance underwriters, and all authorities having jurisdiction. Owner's representatives shall be present inspect tests. Obtain all required certificates of approval and pay any fees or costs in conjunction therewith.

B. Perform hydrostatic tests for all sections of the sprinkler piping systems installed under this Section, at not less than 200 psi pressure for two hours, or at 50 psi in excess of the maximum pressure, when the maximum pressure to be maintained in the system is in excess of 150 psi. The test pressure shall be read from a gauge located at the low elevation point of the individual system, or portion of the system being tested. The static pressure at the inlet of control valve on the 87th floor of 2 WTC is 124.7 psig.

C. Before an application for final acceptance of the work will be considered, all tests required and deemed necessary to show proper execution of the work shall have been performed in the presence of the Owner's representative. Scheduling of all testing procedures shall be arranged to suit the convenience of the Owner's representative.

1.13 EXISTING SPRINKLER SYSTEM

A. Refurbish, relocate, modify existing sprinkler system.

B. Existing system shall be changed as required in accordance with the new alteration work.

C. Drain down existing piping to facilitate new work.

1.14 NOTES

A. Locations and type of new sprinkler heads are indicated. New piping with connections to existing system is not shown. Contractor shall provide all new piping with new connections to existing system and modify existing system as required.

B. Remove existing sprinkler heads as required. Removal and/or addition of sprinkler heads includes removal and/or addition or piping, fittings and all associated work.

C. Sprinkler piping layout and pipe sizes shall be determined by the contractor in accordance with the room layouts and final locations of lights, diffuses, grilles, etc. and final ceiling construction type and architectural features.

D. Utilize the existing sprinkler floor layout drawings and existing as-built conditions in conjunction with the new sprinkler work in order to provide an overall sprinkler installation compatible with the existing as-built conditions.

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SECTION 15500

HVAC

1.01 GENERAL

A. Applicable provisions of the general construction specifications shall apply.

B. The contractor shall coordinate his work or adjust same to that of other trades, in order that conflicts in space locations do not occur.

C. The work under this contract shall be performed simultaneously with work of other trades, so as not to delay the overall progress of work.

D. This contractor shall be responsible for his work with its completion and final acceptance and shall replace any of same which may be damaged, lost or stolen, without additional cost to the owner.

E. This contractor shall provide all items of labor and materials not specifically indicated, but required to complete the intended installations.

F. Prior to submitting bid proposal, contractor shall visit the site and familiarize himself with the existing ac system, ductwork, piping, etc in order to understand entire scope of work in order to prevent any extra charges once work begins.

G. All work to be in accordance with all applicable governing codes and regulations.

H. Existing ducts and pipes, in most instances shall remain unchanged. However, contractor shall modify existing supply and return ductwork and piping as shown on the drawings.

I. All new ductwork shall be kept as high as possible so as to maintain ceiling heights shown on architectural drawings.

J. Mechanical contractor shall coordinate his work with all other trades.

K. Where piping, lights and ductwork conflict, ductwork shall set up and down.

L. Connect new work to existing as shown on the drawings.

M. Contractor shall provide 16 gauge access doors to general contractor for installation in gypsum board ceilings for access to all volume dampers, fire dampers, valves, etc. However, Architect must approve all locations prior to installation. Access kits shall be provided in acoustical tile ceilings as tagged by this contractor for access to all volume dampers and fire dampers.

N. Contractor shall coordinate exact location of all air outlets with architect's reflected ceiling drawings.

1.02 **CODES, PERMIT AND INSPECTION**

A. All work shall meet or exceed latest requirement of the national, state, country , municipal and other authorities exercising jurisdiction of their work of this project. In addition it must meet all the requirements of P.A. of N.Y. & N.J.

B. Any portion of work which is not subject to the approval of an authority having jurisdiction shall be provided in accordance with national fire protection association requirements.

C. Pay all required fees, secure permits and inspection certifications and transmit same to the owner at the completion of the work.

D. Contractor shall be responsible for filing all documents with all city agencies. Controlled inspection shall be done by this contractor..

1.03 **SHOP DRAWINGS & EQUIPMENT SUBMISSIONS**

A. For (4) of ductwork, piping and certified equipment manufacturer's data shall be submitted for approval prior to fabrications, erection or purchase.

1.04 **APPROVAL AND SUBSTITUTION**

A. It is the intent of the specifications that wherever a manufacturer is specified and substitutions are made, they shall conform in all respect to the specified item. Criteria as delineated for equipment shall be interpreted as minimum performance requirements.

B. Substituted equipment where permitted must conform to space requirement, any substituted equipment that cannot meet space requirements whether approved or not shall be replaced at the contractor's expense. Any modification of related systems or additional costs that result from substituted equipment shall be borne by this contractor.

1.05 **TESTING, ADJUSTING AND BALANCING**

A. This contractor shall make all required adjustments of all systems and devices until all specified performance are met.

B. All systems shall be tested and balanced to conform to quantities shown on drawings. Air balances shall be performed by an independent contractor who is a member of the associated air balance . Three (3) copies of test and balance reports shall be submitted for approval by the engineer.

1.06 **GUARANTEE AND SERVICE**

A. The contractor shall guarantee the entire installation for a period of one year from the date of the final acceptance of the installation by the owner.

B. The contractor shall during the period of guarantee replace or repair at his owner expense any piece of equipment and/or material which is found to be defective. The contractor shall also repair all damage to surrounding work caused by the failure, repair or replacement of defective equipment at his own expense.

1.07 DUCTWORK

A. Ductwork layouts and routes as shown on the drawings are schematic therefor changes in duct sizes and/or locations shall be made where necessary to conform to space conditions or obtain maximum headroom conditions without additional costs.

B. Ductwork shall be galvanized steel as indicated on the drawings and shall be fabricated in conformance with latest recommendations of SMACNA (including gauges). Duct leakage shall not exceed 5%.

DUCT SYSTEM	SMACNA TABLE CLASS	SMACNA TABLE CLASS	SMACNA TABLE CLASS
All ductwork downstream of shafts and AC units	1-5	+2" W.G.	B

C. All low velocity branch supply air duct splits and taps shall be provided with manual volume dampers. Each volume damper shall be provided with quadrant and position lever with wing nut type lock. Provide volume damper for each air outlet.

D. Flexible Air Duct

1. Flexible air ducts shall be all metal construction consisting of bonded two-ply laminate mechanically corrugated for strength and air tightness. Flexible air duct shall be semi-rigid construction capable of being easily hand performed into required elbows or offsets to suit job conditions without subsequent sagging or droop. Duct connections to equipment outlet collars shall be made in accordance with the duct manufacturer's recommendations. Flexible duct shall be Flexmaster Type V as manufactured by Flexmaster USA Corporation, or approved equal.

2. Material shall have been tested by Underwriters Laboratories Inc. and given the listing 181, Class 1 duct material and comply with NFPA 90A. (Fire spread rate of 25 and maximum smoke developed rate of 50). Insulated assembly with a vapor barrier jacket (C-factor of 0.23 BTUH/S.F. Deg. °F) @ 75°F with MEA. Flexible duct shall be no longer than 3'0".

3. Connections shall be clamped with Ideal Type 52 hose clamps.

4. Length of flexible duct shall be as shown on the drawings but shall not exceed length dictated by local jurisdiction.

5. Cut duct to proper length to avoid sharp bends.

E. All square elbows shall be provided with ducturns.

F. First 15'-0" of duct from discharge of HVAC/ unit shall be acoustically lined with internal lining 1" thick, Johns Manville, Linacoustics. Duct sizes shown on drawings are clear dimensions.

1.08 **AIR DISTRIBUTION DEVICES**

A. Refer to schedules on drawings for sizes.

B. Ceiling diffuser shall be Price, Titus or Anemostat.

1. Diffusers, supply shall be 24" x 24" face size neck size as shown with opposed blade dampers.

2. Diffusers, return shall be 24' x 24' face size, neck size as shown.

1.09 **INSULATION**

A. Insulation shall be applied to clean dry surfaces.

B. Insulation shall have composite (insulation, jacket or facing, and adhesive used to adhere the facing or jacket to the insulation) fire and smoke hazard ratings as tested by procedure ASTM E.84, NFPA 255 or UL 723 not exceeding:

Flame Spread	25
Smoke Developed	50

Accessories such as adhesives, mastics, cements, and tapes for fittings shall have the same component rating as listed above. All products or their shipping cartons shall bear a label indicating that flame and smoke ratings do not exceed requirements. Treatment of jackets or facings to impart flame and smoke-safety shall be permanent. The use of watersoluble treatments is prohibited.

C. All supply air ductwork except that which is acoustically lined, shall be covered with 1" thick flexible fiberglass insulation with a maximum "K" factor of .15 at 75°F mean temperature, with reinforced foil-faced flame resistant draft vapor barrier.

D. All chilled water supply and return piping shall be insulated with 1-1/2" thick glass fiber insulation with a maximum "K" factor of .24 at 75°F mean temperature with factory applied all service jacket. Fittings and valves shall be insulated with minimum one-pound density FSK-faced fiberglass blanket 18 gauge copperclad wire. Exposed edges of insulation shall be sealed off with BF 30-35. Finished thickness of insulation on fittings and valves shall be at least as great as that on adjoining pipes.

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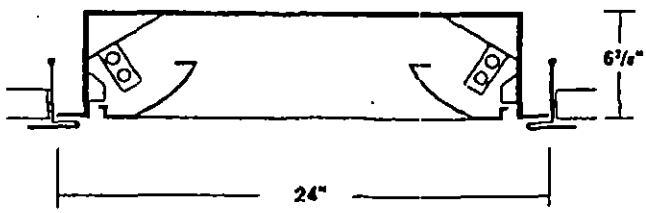
Series 202/BX

"A/A"



Wattage	(2) 40 watt Biax lamps, 120V magnetic ballast
Design Date	1993
Materials	20 ga. steel housing and reflector with custom perforated pattern lamp shields.
Description	2x2 or 2x4 recessed direct, totally diffused light, UL listed

RECOMMENDED FOR:

- *Hallways*
- *Small Offices*
- *Open Landscape*
- *Hospitality*
- *Showrooms*
- *VDT workspaces*
- *Trading Floors*

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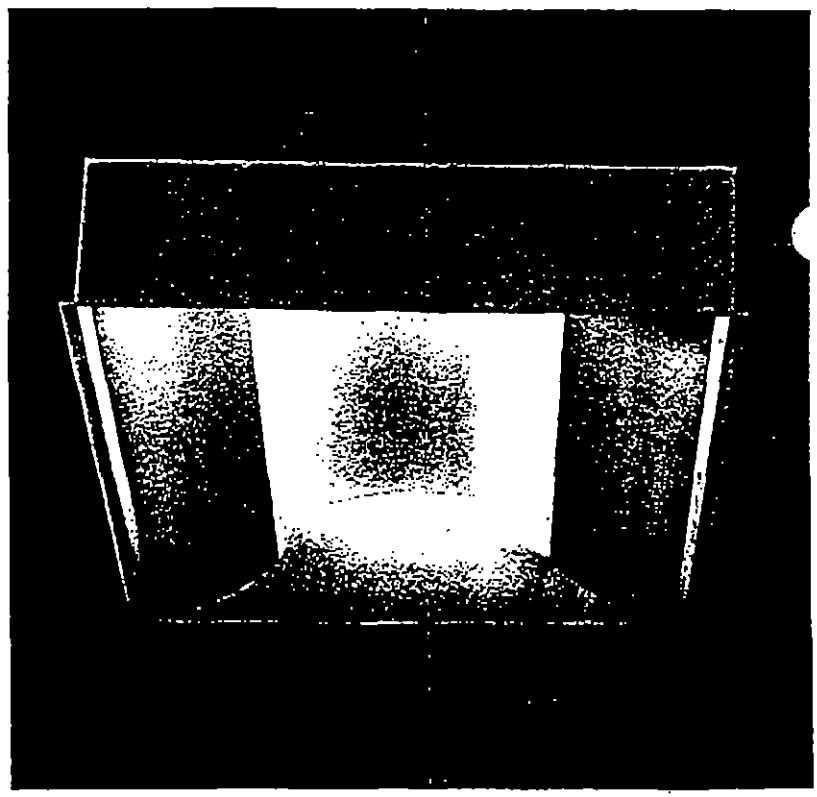

PATENT PENDING

ORDERING INFORMATION

CATALOG NO.	LAMPS	SIZE (Ft.)
202R/2BX-A	(2) 40W Biax	2'x2' nom.
202R/4BX-4	(4) 40W Biax	2'x2' nom.

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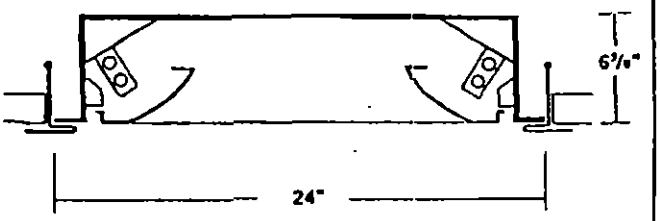
neoray NATURALLY
Neo-Ray Lighting 537 Johnson Avenue, Brooklyn NY 11237 • Tel: (718) 456-7400 • Fax: (718) 456-5492

Series 202/BX

A/A1



Wattage	(2) 40 watt Biax lamps, 120V magnetic ballast
Design Date	1993
Materials	20 ga. steel housing and reflector with custom perforated pattern lamp shields.
Description	2x2 or 2x4 recessed direct, totally diffused light, UL listed

RECOMMENDED FOR:

- *Hallways*
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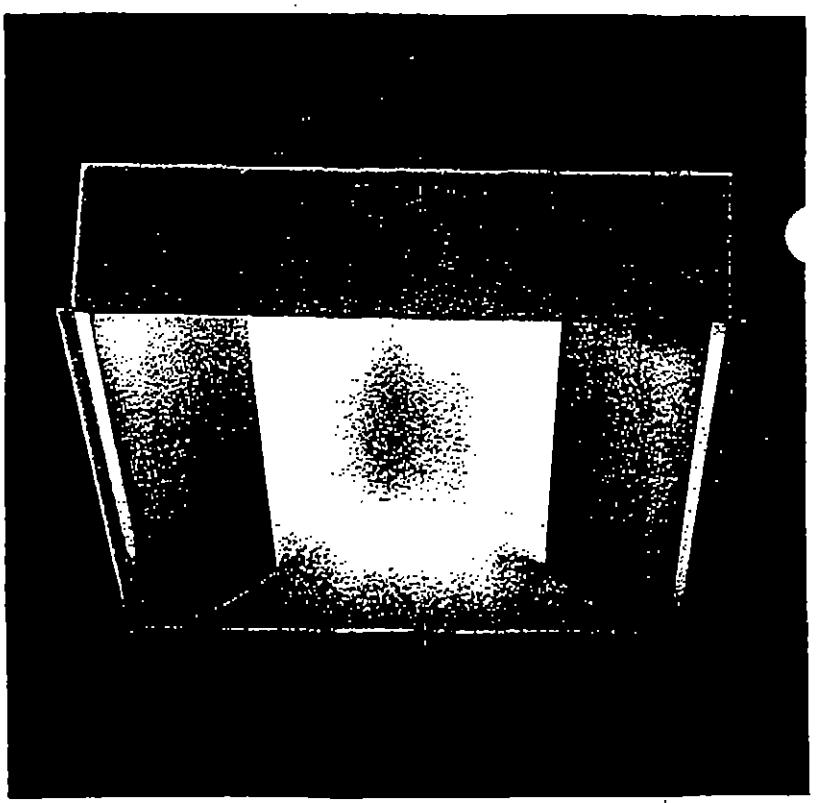


PATENT PENDING

ORDERING INFORMATION

CATALOG NO.	LAMPS	SIZE (Ft.)
202R/2BX-A	(2) 40W Biax	2'x2' nom.
202R/4BX-4	(4) 40W Biax	2'x2' nom.

neoray NATURALLY

Neo-Ray Lighting 537 Johnson Avenue, Brooklyn NY 11237 • Tel: (718) 456-7400 • Fax: (718) 456-5492

Fenestra Series 202/204/BX

RECESSED LAY IN, Luminaire

A/A1

SPECIFICATIONS

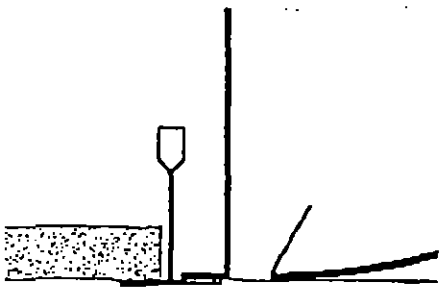
Lighting	Direct/Ambient
Mounting	Recessed lay-in
Lengths	2' x 2' or 2' x 4'
Shielding	Perforated metal backed by a white acrylic diffuser
Lamps	(2) or (4) 40W T5 rapid start biaxial lamps (not by Neo-Ray)
Ballast	120 volt, 270 mA, electronic, class P
Material	20 ga. steel construction
Finish	Baked on low gloss white powder coated polyester-epoxy

U.L. listed and union made, IBEW/AFL-CIO

OPTIONS

Ballast	277 volt, Dimming
Emergency	Battery-pack

MOUNTING

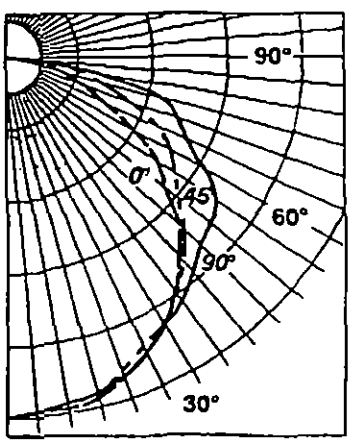


D Lay-in Exposed Tee Grid

PHOTOMETRICS

Report No. 8298.2 for Cat No. 202/BX
Lamp Type: F40BXSPX35/RS, 3150 lumens
I.E.S. data disk no. 202DRA2Y.IES

CANDLEPOWER DISTRIBUTION



COEFFICIENTS OF UTILIZATION

FLOOR	20%											
CEILING	80%				50%				30%			
WALL	70%	50%	30%	10%	50%	30%	10%		50%	30%	10%	
RCR	ZONAL CAVITY METHOD											
1	.52	.50	.48	.46	.47	.45	.44		.45	.44	.42	
2	.48	.43	.40	.37	.41	.38	.36		.39	.37	.35	
3	.43	.38	.34	.31	.36	.33	.30		.35	.32	.30	
4	.40	.34	.29	.26	.32	.28	.26		.31	.28	.25	
5	.36	.30	.25	.22	.28	.24	.21		.27	.24	.21	
6	.33	.26	.22	.19	.25	.21	.19		.24	.21	.18	
7	.30	.24	.19	.16	.23	.19	.16		.22	.18	.16	
8	.28	.21	.17	.14	.20	.17	.14		.20	.16	.14	
9	.26	.19	.15	.12	.18	.15	.12		.18	.14	.12	
10	.24	.17	.13	.11	.16	.13	.11		.16	.13	.11	

LUMEN SUMMARY

ZONE	LUMENS	% LAMP	% FIXT
0-30	748	11.9	24.6
0-40	1229	19.5	40.5
0-60	2230	35.4	73.4
0-90	3037	48.2	100.0
90-180	0	0	0
0-180	3037	48.2	100.0

IES Spacing Criteria:
End = 1.3 Diagonal = 1.3 Cross = 1.3

CANDLEPOWER DIST.

VERT. ANG.	HORIZ ANGLE 0	22.5	45	67.5	90	ZONAL LUMENS
0	951	951	951	951	951	
5	945	954	945	946	943	90.4
10	945	946	949	939	927	
15	929	932	927	912	915	261.7
20	898	887	883	891	894	
25	859	853	845	861	860	395.6
30	814	817	814	823	818	
35	761	760	755	775	788	481.3
40	689	702	706	735	746	
45	627	617	649	678	703	505.1
50	546	553	581	653	684	
55	478	484	534	625	660	496.1
60	392	412	492	576	595	
65	315	337	437	494	517	417.9
70	244	272	365	437	473	
75	178	207	284	373	426	308.4
80	113	131	201	280	294	
85	42	49	75	99	99	80.1
90	0	0	0	0	0	

Neo-Ray reserves the right to change details of design, material and finish in any way that will not alter the appearance or reduce the performance

Printed in USA 1997

neo-ray NATURALLY
NEO-RAY LIGHTING 537 Johnson Avenue, Brooklyn, NY 11237 Tel: 718/456-7400 Toll free: 800/221-0946 Fax: 718/456-5492

SUPER LAFLUX® 226/8

recessed compact fluorescent downlight/wallwasher

"B"

1-52

FEATURES

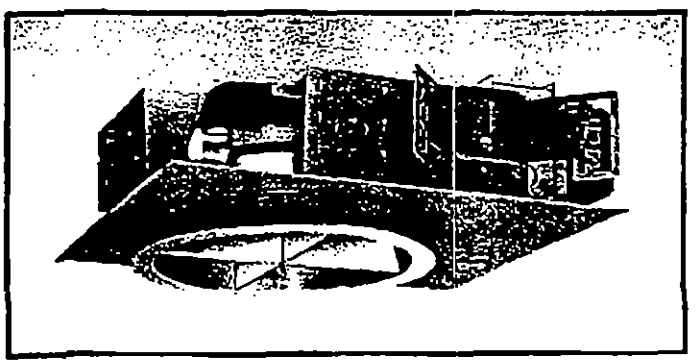
Super Baflux 226/8 is an efficient 8" aperture downlight, for use with two 26-watt compact fluorescent lamps. Its unique parabolic reflector and cross-baffle assembly provides precise optical control with very low aperture brightness. Shielding angles are 32° parallel to and 40° perpendicular to the lamps. Recess depth is only 4 ¾".

One housing allows interchangeable use of downlight and wallwash reflectors, permitting housings to be installed first and reflectors to be installed or changed at any time.

Super Baflux 226/8 uses two 26-watt, 4-pin lamps providing 3600 lumens (nearly as many as a 200-watt incandescent), c 10,000-hour life, a color rendering index (CRI) of 85, and color temperatures as warm as 2700°K (nearly duplicating the color qualities of incandescent)

Reflector assemblies are available in clear natural aluminum and champagne gold with anti-iridescent anodizing, as well as in pewter, bronze and white enamel finishes. Wallwash reflectors are also available.

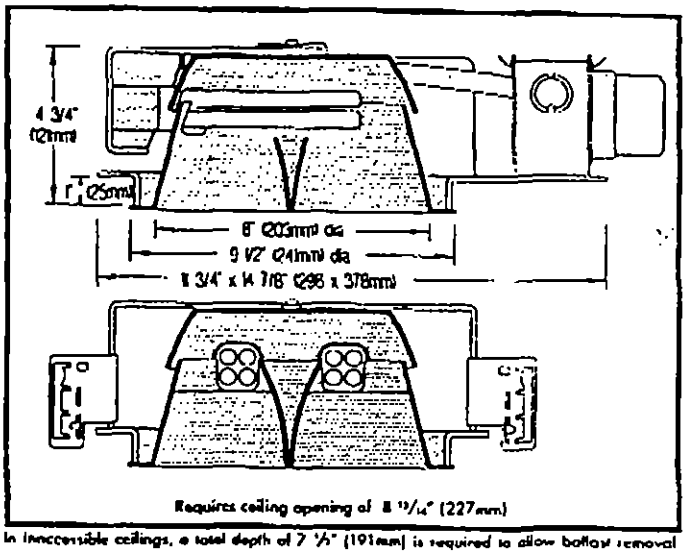
Super Baflux 226/8 includes a pair of mounting bars (¾" x 27" C channel). Specialty bars for wood joist and T-bar installations are available as accessories.



APPLICATIONS

Fixture is recommended for downlighting or wallwashing in nearly all architectural environments, especially those spaces where non-directional luminaires are preferred over rectangular troffers. These include offices, lobbies, corridors, restrooms and public areas. The shallow recess depth allows mounting in constricted plenum situations

Fixture is UL listed for Damp Location (may not be suitable for some outdoor environments). Fixture is union made IBEW and in compliance with the component based efficiency standards of the 1995 New York State Energy Conservation Code. Fixture is prewired with high power factor Class P electronic ballast and approved for eight #12 wire 75°C branch circuit pull-through wiring. Removal of the reflector allows access to the ballast and junction box.



Requires ceiling opening of 8 ¹⁵/₁₆" (227mm)

In inaccessible ceilings, a total depth of 7 ½" (191mm) is required to allow ballast removal

PRODUCT CODE

For a complete product code, list the basic unit and select one code item from each of the following boxes.

Basic Unit	SB 226/8

Reflector Type	
Downlight	no suffix
Wallwash	WW

Voltage	
120 volt service	120
277 volt service	277

Reflector and Flange Color			
Clear	COL	Pewter	POL
Champagne Gold	GOL	Bronze	ZOL
Semi-specular Clear	EOL	White	WOL

Standard reflector flange continues reflector finish. White painted flanges and custom painted flanges are available. Add WF (white flange) or CCF (custom color flange).

OPTIONS

Specify by adding to the basic unit.

Equipped with **magnetic ballast.** Use 2-pin lamps only (G-24D3 base)	– MAG
Dimmable; with Lutron® Hi-lume® electronic dimming ballast; for use with Lutron controls (by others). Not for outdoor application	– DM
Emergency battery pack operates lamp in event of power outage. Not available with DWW reflector. An additional 3 ½" (89mm) is required to remove EM pack through aperture. No through wiring. Not for outdoor application	– EM
⅛" (3mm) thick **prismatic acrylic lens** within reflector	– P
⅛" (3mm) thick **diffuse white acrylic** within reflector	– D
⅛" (3mm) thick **clear acrylic shield** within reflector	– PS

▶ For combinations of the Options above, contact factory or Edison Price Lighting represen

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SUPER BAFLUX* 226/8

recessed compact fluorescent downlight/wallwasher

'B'

1-52

FEATURES

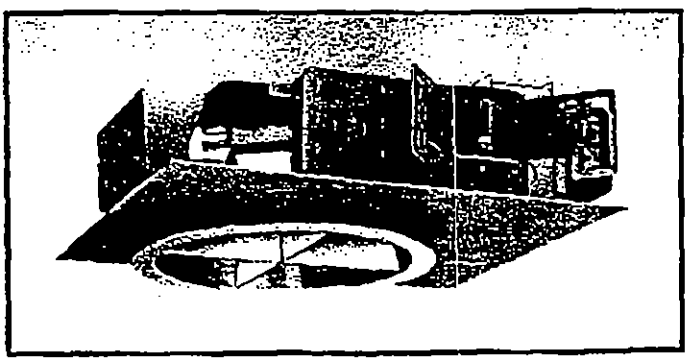
Super Baflux 226/8 is an efficient 8" aperture downlight, for use with two 26-watt compact fluorescent lamps. Its unique parabolic reflector and cross-baffle assembly provides precise optical control with very low aperture brightness. Shielding angles are 32° parallel to and 40° perpendicular to the lamps. Recess depth is only 4 3/4".

One housing allows interchangeable use of downlight and wallwash reflectors, permitting housings to be installed first and reflectors to be installed or changed at any time.

Super Baflux 226/8 uses two 26-watt, 4-pin lamps providing 3600 lumens (nearly as many as a 200-watt incandescent), a 10,000-hour life, a color rendering index (CRI) of 85, and color temperatures as warm as 2700°K (nearly duplicating the color qualities of incandescent).

Reflector assemblies are available in clear natural aluminum and champagne gold with anti-iridescent anodizing, as well as in pewter, bronze and white enamel finishes. Wallwash reflectors are also available.

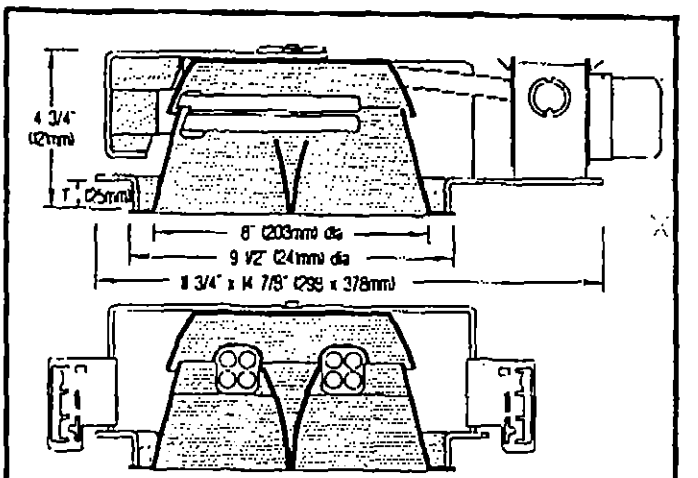
Super Baflux 226/8 includes a pair of mounting bars (1¼" x 27" C channel). Specialty bars for wood joist and T-bar installations are available as accessories.



APPLICATIONS

Fixture is recommended for downlighting or wallwashing in nearly all architectural environments, especially those spaces where non-directional luminaires are preferred over rectangular troffers. These include offices, lobbies, corridors, restrooms and public areas. The shallow recess depth allows mounting in constricted plenum situations.

Fixture is UL listed for Damp Location (may not be suitable for some outdoor environments). Fixture is union made (BEW and in compliance with the component based efficiency standards of the 1995 New York State Energy Conservation Code. Fixture is prewired with high power factor Class P electronic ballast and approved for eight #12 wire 75°C branch circuit pull-through wiring. Removal of the reflector allows access to the ballast and junction box.



Requires ceiling opening of 8 15/16" (227mm)

In inaccessible ceilings, a total depth of 7 ½" (191mm) is required to allow ballast removal.

PRODUCT CODE

For a complete product code, list the basic unit and select one code item from each of the following boxes.

Basic Unit	SB 226/8

Reflector Type	
Downlight	no suffix
Wallwash	WW

Voltage	
120 volt service	120
277 volt service	277

Reflector and Flange Color			
Clear	COL	Pewter	POL
Champagne Gold	GOL	Bronze	ZOL
Semi-specular Clear	EOL	White	WOL

Standard reflector flange continues reflector finish. White painted flanges and custom painted flanges are available. Add WF (white flange) or CCF (custom color flange)

OPTIONS

Specify by adding to the basic unit.

Equipped with magnetic ballast. Use 2-pin lamps only (G-24D3 base)	– MAG
Dimmable; with Lutron® Hi-lume® electronic dimming ballast; for use with Lutron controls (by others). Not for outdoor application	– DM
Emergency battery pack operates lamp in event of power outage. Not available with DWW reflector. An additional 3 ½" (89mm) is required to remove EM pack through aperture. No through wiring. Not for outdoor application	– EM
⅛" (3mm) thick prismatic acrylic lens within reflector	– P
⅛" (3mm) thick diffuse white acrylic within reflector	– D
⅛" (3mm) thick clear acrylic shield within reflector	– PS

▶ For combinations of the Options above, contact factory or Edison Price Lighting representative.

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SUPER BAFLUX 226/8

B/B1

PHOTOMETRIC REPORT

Independent Testing Laboratories Report No. 39126

Luminaire ..... recessed compact fluorescent downlight with white top reflector; specular formed main reflector, specular parabolic cross-baffle
Lamps ..... two 26-watt quad, 4-pin, G24q-3 base, 1800 lumens each
Efficiency 47.5%
Spacing Criteria ..... 0°-1.2, 90°-1.2, 180°-1.3

BALLAST INFORMATION

Voltage	120	277
Input Watts	54	59
Line Current (A)	.45	.22
Power Factor (%)	>99	>99
Min. Starting Temp* (°F)	0	0

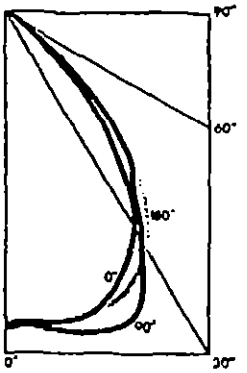
*Consult lamp manufacturers for specific temperatures.

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixture
0 - 30°	886	24.6	51.8
0 - 40°	1366	37.9	79.9
0 - 60°	1708	47.4	100.0
0 - 90°	1709	47.5	100.0
90 -180°	0	0.0	0.0
0 -180°	1709	47.5	100.0

CANDLEPOWER DISTRIBUTION (Candela)

Vertical Angle	Horizontal Angle				
	0.0	45.0	90.0	135.0	180.0
0	1055	1055	1055	1055	1055
5	1060	1060	1060	1057	1053
15	1055	1075	1110	1105	1059
25	938	1021	1064	1086	997
35	686	743	733	862	799
45	302	305	415	415	442
55	19	37	25	67	85
65	0	0	0	0	0
75	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0



LUMINANCE DATA (Candela/m²)

Vertical Angle	Average 0° Latitude	Average 90° Latitude	Average 180° Latitude
45	13165	18095	19270
55	1020	1343	4570
65	0	0	0
75	0	0	0
85	0	0	0

To convert cd/m² to footlamberts, multiply by 0.2919.

COEFFICIENTS OF UTILIZATION – ZONAL CAVITY METHOD

Effective Floor Cavity Reflectance 20%

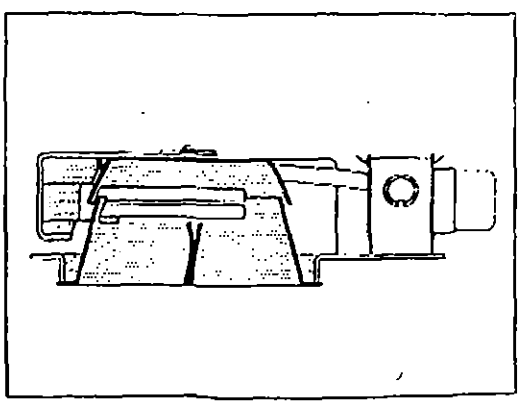
Ceiling Reflectance (%)	80				70				50			30			10			0
Wall Reflectance (%)	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio																		
0	57	57	57	57	55	55	55	55	53	53	53	51	51	51	48	48	48	48
1	54	52	51	50	52	51	50	49	49	48	47	47	47	46	46	45	45	44
2	50	48	46	44	49	47	45	43	45	44	42	44	43	41	43	42	41	40
3	47	44	41	39	46	43	41	39	42	40	38	41	39	38	40	38	37	36
4	44	40	37	35	44	40	37	35	39	36	34	38	36	34	37	35	34	33
5	42	37	34	32	41	37	34	32	36	33	31	35	33	31	34	32	31	30
6	39	34	31	29	38	34	31	29	33	30	28	32	30	28	32	30	28	27
7	37	32	29	26	36	31	28	26	31	28	26	30	28	26	30	27	26	25
8	35	29	26	24	34	29	26	24	29	26	24	28	26	24	28	25	24	23
9	33	27	24	22	32	27	24	22	27	24	22	26	24	22	26	23	22	21
10	31	26	22	20	30	25	22	20	25	22	20	25	22	20	24	22	20	19

SUPER BAFLUX 226/8 WW

WALLWASH INFORMATION

Distance From Ceiling (Feet)	2'6" From Wall; 2'6" O.C.		3' From Wall; 3' O.C.		4' From Wall; 3'6" O.C.	
	Below Fixture	Between Fixtures	Below Fixture	Between Fixtures	Below Fixture	Between Fixture
1	13	12	8	6	4	3
2	26	27	15	15	7	7
3	31	35	21	23	11	12
4	30	32	21	24	14	15
5	26	26	21	22	14	16
6	21	21	19	18	14	15
7	17	16	16	15	14	13
8	13	13	13	12	12	12
9	10	10	10	10	11	10
10	8	8	8	8	9	9
11	7	6	7	7	8	8
12	5	5	6	6	6	6

All vertical footcandles are initial values with no contribution from ceiling or floor reflectances. Computation performed with a total of five wallwashers.



Printed on recycled paper in USA

"C"

WASHLUX® 126/6 226/6

recessed compact fluorescent lensed wallwashers

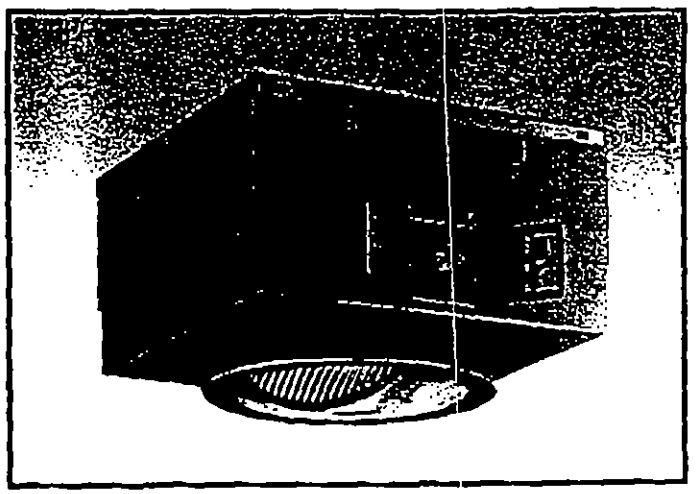
FEATURES

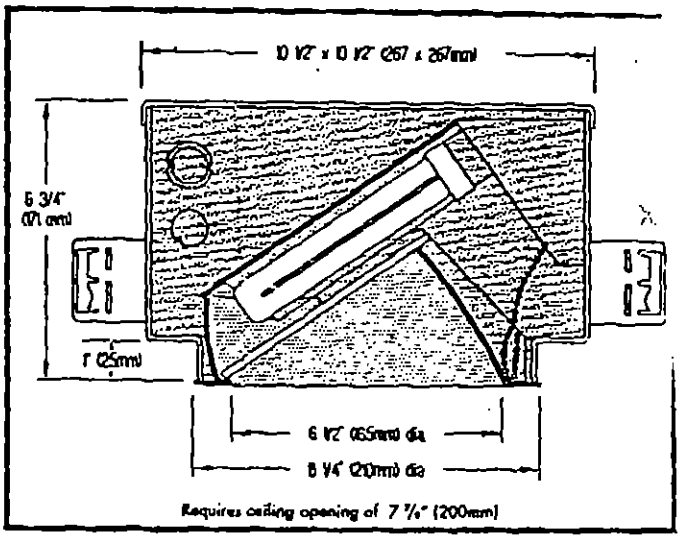
Washlux 126/6 and 226/6 are efficient compact fluorescent wallwashers which provide uniform illumination on vertical surfaces up to the ceiling line. The fixtures have a two-part internal reflector, a 55° glass spread lens, and an external Darklite® reflector designed to minimize aperture brightness. Aperture diameter is 6 ½" and recess depth is only 6 ¾".

Washlux 126/6 uses a 26-watt, 4-pin lamp and consumes a total of only 26 watts when operated at 120 volts. Washlux 226/6 uses two lamps for additional illumination, consuming 60 watts when operated at 120 volts. Compact fluorescent lamps have a 10,000-hour life, a color rendering index (CRI) of 85, and are available in a range of color temperatures as warm as 2700°K (nearly duplicating the color qualities of incandescent).

Reflectors are available in clear natural aluminum or champagne gold with anti-iridescent anodizing. Specular black reflectors are also available.

Both fixtures include a pair of mounting bars (¾" x 27" C channel). Specialty bars for wood joist and T-bar installations are also available.





Requires ceiling opening of 7 7/8" (200mm)

APPLICATIONS

Fixtures are recommended for wallwashing in offices, stores, lobbies and public areas. The use of matte wall finishes is recommended to avoid specular reflections.

Fixtures are UL listed for Damp Location (may not be suitable for some outdoor environments). Fixtures are union made IBEW and in compliance with the component based efficiency standards of the 1995 New York State Energy Conservation Code. Fixtures are prewired and approved for eight #12 wire 75°C branch lighting circuit pull-through wiring. High power factor Class P electronic ballast is standard. Access to the ballast and wiring compartment is provided by removing a snap-in cover. Access to plenum is provided by opening a 5 ¼" square panel.

PRODUCT CODE

For a complete product code, list the basic unit and select one code item from each of the following boxes.

Basic Unit	WLX 126/6 or WLX226

Voltage	
120 volt service	120
277 volt service	277

Reflector and Flange Color	Overlap	Flush
Clear	COL	CFL
Champagne Gold	GOL	GFL
Semi-specular Clear	EOL	EFL
Black	BOL	BFL

Standard reflector flange continues reflector finish. White painted flanges and custom painted flanges are available. Add WF (white flange) or CCF (custom color flange).

Example: WLX 226/6 120 COL is the complete product code for a two-lamp fixture with a clear overlap reflector, suitable for 120 volt operation.

OPTIONS

Specify by adding to the end of the basic unit.

Equipped with magnetic ballast; use 2-pin lamps only (G24-D3 base) ..... – MAG

Dimmable; with Lutron® Hi-lume® electronic dimming ballast; for use with Lutron controls (by others). Recess depth increases to 8 ⅜" (213mm), plus an additional 3 ½" (89mm) to remove ballast through aperture. Not for outdoor application ..... – DM

Emergency battery pack operates one lamp in case of power outage. Recess depth increases to 8 ½" (216mm), plus an additional 3 ½" (89mm) to remove EM pack through aperture. Not for outdoor application ..... – EM

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"C"

WASHLUX 126/6

PHOTOMETRIC REPORT

Independent Testing Laboratories Report No. 36622
Luminaire .....recessed compact fluorescent lensed wallwasher
Lamp.....one 26-watt quad, 4-pin, G24q-3 base, 1800 lumens

WALLWASH INFORMATION

Distance From Ceiling (Feet)	3' From Wall; 3' O.C.		3'6" From Wall; 3' O.C.		4' From Wall; 3' O.C.	
	Below Fixture	Between Fixtures	Below Fixture	Between Fixtures	Below Fixture	Between Fixtures
1	11	10	7	7	6	5
2	16	15	12	12	10	10
3	16	16	14	14	12	12
4	14	15	13	14	12	12
5	12	12	12	12	11	11
6	9	9	10	10	10	10
7	8	8	8	8	8	8
8	6	6	7	7	7	7
9	5	5	5	5	6	6

All vertical footcandles are initial values with no contribution from ceiling or floor reflectances. Computation performed with a total of five wallwashers.

BALLAST INFORMATION

Voltage	120	277
Input Watts	26	25
Line Current (A)	.22	.09
Power Factor (%)	>99	>99
Min. Starting Temp* (°F)	0	0

*Consult lamp manufacturers for specific temperatures.

WASHLUX 226/6

PHOTOMETRIC REPORT

Independent Testing Laboratories Report No. 36623
Luminaire .....recessed compact fluorescent lensed wallwasher
Lamps .....two 26-watt quad, 4-pin, G24q-3 base, 1800 lumens each

WALLWASH INFORMATION

Distance From Ceiling (Feet)	3' From Wall; 3' O.C.		3'6" From Wall; 3' O.C.		4' From Wall; 3' O.C.	
	Below Fixture	Between Fixtures	Below Fixture	Between Fixtures	Below Fixture	Between Fixtures
1	14	14	9	9	6	5
2	25	25	25	19	19	11
3	26	27	23	23	15	15
4	23	23	22	22	15	15
5	19	19	19	19	14	14
6	15	15	16	16	12	12
7	12	12	13	13	10	10
8	10	10	11	11	9	9
9	8	8	9	9	7	7
10	7	7	7	7	6	6
11	6	6	6	6	5	5
12	5	5	5	5	5	5

All vertical footcandles are initial values with no contribution from ceiling or floor reflectances. Computation performed with a total of five wallwashers.

BALLAST INFORMATION

Voltage	120	277
Input Watts	54	59
Line Current (A)	.45	.22
Power Factor (%)	>99	>99
Min. Starting Temp* (°F)	0	0

*Consult lamp manufacturers for specific temperatures.

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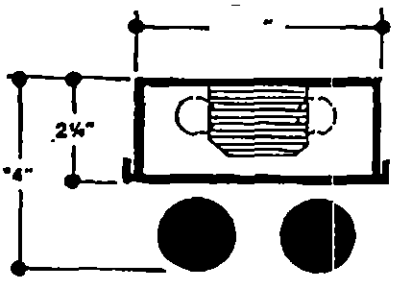
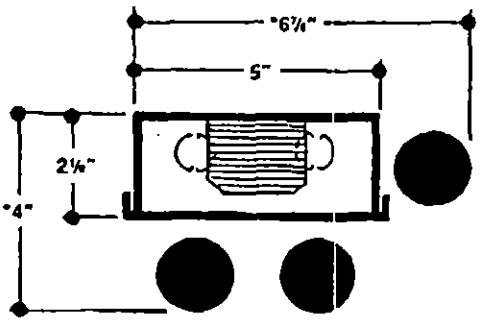
Series 2500



CAT. NO.	NO. AND TYPE LAMPS	LENGTH
2500-215	2-15W-TS	18"
2500-220	2-20W-TS	24"
2500-230	2-30W-RS	36"
2500-230-6T	4-30W-RS	72"
2500-240	2-40W-RS	48"
2500-240-6T	4-40W-RS	96"

Dimensions shown are with T-12 lamps.
*Minus ¼" for OCTRON™ T-8 lamps.
To specify OCTRON™ ballast, add suffix "ESB/OCT" or "ESB/EBO" to cat. no.

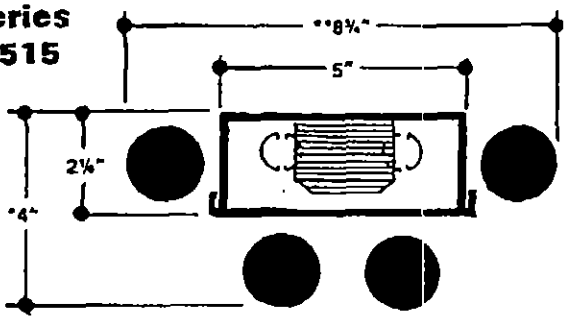
Series 2510



CAT. NO.	NO. AND TYPE LAMPS	LENGTH
2510-315	3-15W-TS	18"
2510-320	3-20W-TS	24"
2510-330	3-30W-RS	36"
2510-330-6T	6-30W-RS	72"
2510-340	3-40W-RS	48"
2510-340-6T	6-40W-RS	96"

Dimensions shown are with T-12 lamps.
*Minus ¼" for OCTRON™ T-8 lamps.
To specify OCTRON™ ballast, add suffix "ESB/OCT" or "ESB/EBO" to cat. no.

Series 2515

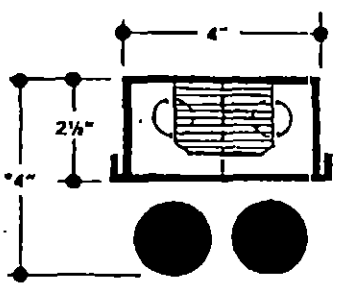


CAT. NO.	NO. AND TYPE LAMPS	LENGTH
2515-415	4-15W-TS	18"
2515-420	4-20W-TS	24"
2515-430	4-30W-RS	36"
2515-430-6T	8-30W-RS	72"
2515-440	4-40W-RS	48"
2515-440-8T	8-40W-RS	96"

Dimensions shown are with T-12 lamps.
*Minus ¼" for OCTRON™ T-8 lamps.
**Minus ½" for OCTRON™ T-8 lamps.
To specify OCTRON™ ballast, add suffix "ESB/OCT" or "ESB/EBO" to cat. no

STAGGERED CHANNELS

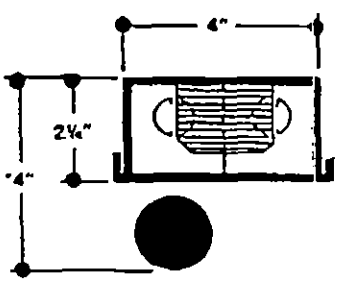
Series 2420



CAT. NO.	NO. AND TYPE LAMPS	LENGTH	
		O.A.	STAGGER
2420-215	2-15W-TS	21"	3"
2420-220	2-20W-TS	27"	3"
2420-230	2-30W-RS	39"	3"
2420-240	2-40W-RS	51"	3"
2420-240-8T	4-40W-RS	99"	3"

Dimensions shown are with T-12 lamps.
*Minus ¼" for OCTRON™ T-8 lamps.
To specify OCTRON™ ballast, add suffix "ESB/OCT" or "ESB/EBO" to cat. no.

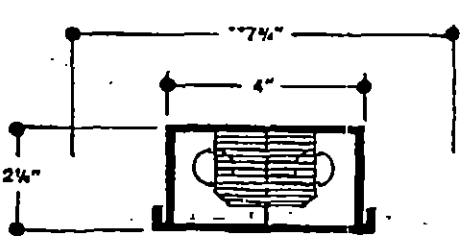
Series 2430



CAT. NO.	NO. AND TYPE LAMPS	LENGTH	
		O.A.	STAGGER
2430-115	1-15W-TS	18"	3"
2430-120	1-20W-TS	24"	3"
2430-130	1-30W-RS	36"	3"
2430-140	1-40W-RS	48"	3"
2430-140-8T	2-40W-RS	96"	3"

Dimensions shown are with T-12 lamps.
*Minus ¼" for OCTRON™ T-8 lamps.
To specify OCTRON™ ballast, add suffix "ESB/OCT" or "ESB/EBO" to cat. no.

Series 2435

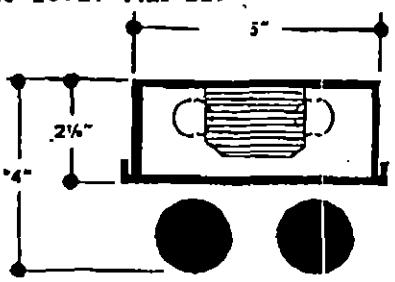


CAT. NO.	NO. AND TYPE LAMPS	LENGTH	
		O.A.	STAGGER
2435-215	2-15W-TS	21"	3"
2435-220	2-20W-TS	27"	3"
2435-230	2-30W-RS	39"	3"
2435-240	2-40W-RS	51"	3"
2435-240-8T	4-40W-RS	99"	3"

Dimensions shown are with T-12 lamps.
**Minus ½" for OCTRON™ T-8 lamps.
To specify OCTRON™ ballast, add suffix "ESB/OCT" or "ESB/EBO" to cat. no.

For options see page 6.

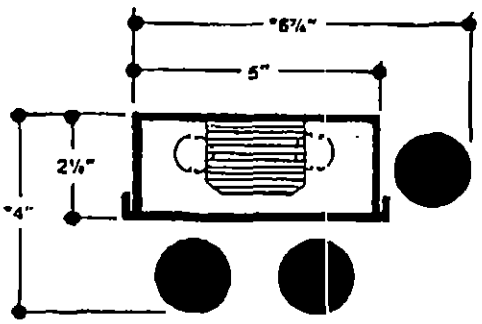
Series 2500



CAT. NO.	NO. AND TYPE LAMPS	LENGTH
2500-215	2-15W-TS	18"
2500-220	2-20W-TS	24"
2500-230	2-30W-RS	36"
2500-230-6T	4-30W-RS	72"
2500-240	2-40W-RS	48"
2500-240-6T	4-40W-RS	96"

Dimensions shown are with T-12 lamps.
*Minus ¼" for OCTRON™ T-8 lamps.
To specify OCTRON™ ballast, add suffix "ESB/OCT" or "ESB/EBO" to cat. no.

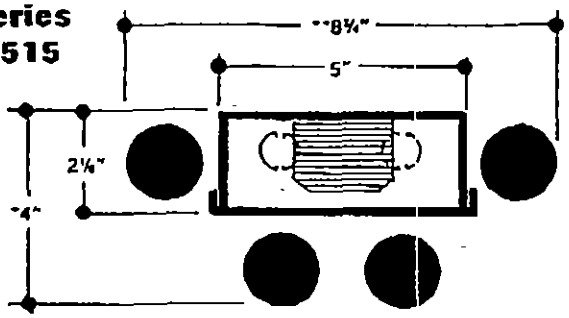
Series 2510



CAT. NO.	NO. AND TYPE LAMPS	LENGTH
2510-315	3-15W-TS	18"
2510-320	3-20W-TS	24"
2510-330	3-30W-RS	36"
2510-330-6T	6-30W-RS	72"
2510-340	3-40W-RS	48"
2510-340-8T	6-40W-RS	96"

Dimensions shown are with T-12 lamps.
*Minus ¼" for OCTRON™ T-8 lamps.
To specify OCTRON™ ballast, add suffix "ESB/OCT" or "ESB/EBO" to cat. no.

Series 2515

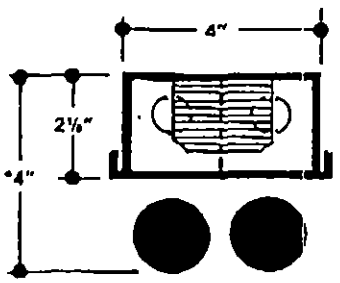


CAT. NO.	NO. AND TYPE LAMPS	LENGTH
2515-415	4-15W-TS	18"
2515-420	4-20W-TS	24"
2515-430	4-30W-RS	36"
2515-430-6T	8-30W-RS	72"
2515-440	4-40W-RS	48"
2515-440-8T	8-40W-RS	96"

Dimensions shown are with T-12 lamps.
*Minus ¼" for OCTRON™ T-8 lamps.
**Minus ½" for OCTRON™ T-8 lamps.
To specify OCTRON™ ballast, add suffix "ESB/OCT" or "ESB/EBO" to cat. no.

STAGGERED CHANNELS

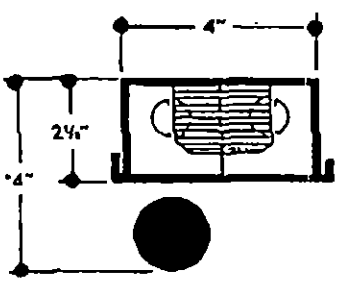
Series 2420



CAT. NO.	NO. AND TYPE LAMPS	LENGTH	
		O.A.	STAGGER
2420-215	2-15W-TS	21"	3"
2420-220	2-20W-TS	27"	3"
2420-230	2-30W-RS	39"	3"
2420-240	2-40W-RS	51"	3"
2420-240-8T	4-40W-RS	99"	3"

Dimensions shown are with T-12 lamps.
*Minus ¼" for OCTRON™ T-8 lamps.
To specify OCTRON™ ballast, add suffix "ESB/OCT" or "ESB/EBO" to cat. no.

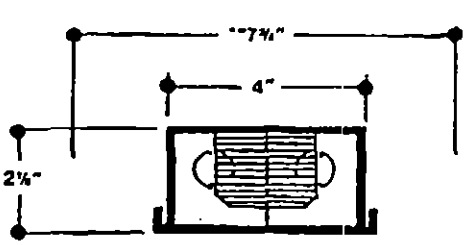
Series 2430



CAT. NO.	NO. AND TYPE LAMPS	LENGTH	
		O.A.	STAGGER
2430-115	1-15W-TS	18"	3"
2430-120	1-20W-TS	24"	3"
2430-130	1-30W-RS	36"	3"
2430-140	1-40W-RS	48"	3"
2430-140-6T	2-40W-RS	96"	3"

Dimensions shown are with T-12 lamps.
*Minus ¼" for OCTRON™ T-8 lamps.
To specify OCTRON™ ballast, add suffix "ESB/OCT" or "ESB/EBO" to cat. no.

Series 2435



CAT. NO.	NO. AND TYPE LAMPS	LENGTH	
		O.A.	STAGGER
2435-215	2-15W-TS	21"	3"
2435-220	2-20W-TS	27"	3"
2435-230	2-30W-RS	39"	3"
2435-240	2-40W-RS	51"	3"
2435-240-6T	4-40W-RS	99"	3"

Dimensions shown are with T-12 lamps.
**Minus ½" for OCTRON™ T-8 lamps.
To specify OCTRON™ ballast, add suffix "ESB/OCT" or "ESB/EBO" to cat. no.

For options see page 6

****

LUMEN MICRO

****

The World Trade Center

Elevator Lobby and Corridor Upgrade

Corridor Emergency Lighting Analysis

REPORT FOR:

The Port Authority

REPORT BY:

SM

Cosentini Associates

VERSION 6.0

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2540 FRONTIER AVE. SUITE #107, BOULDER, CO. 80301

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DESIGN FILE: PA2.DES

ROOM CHARACTERISTICS

LUMINAIRE DESCRIPTION(S):

LUMINAIRE NUMBER..... 1
DESCRIPTION..... irect recessed compact fluorescent downlight, 8" round
FROM DATABASE FILE..... C:\LMV5\IES\EPI.93\COMPFLU\BAF8COL.IES
DATABASE NUMBER..... 1
TOTAL INPUT WATTS..... 34.0
X, Y AND Z DIMENSIONS... .58 .58 .00
UNITS FOR DIMENSIONS.... FEET
CANDLEPOWER MULTIPLIER.. 1.60
LAMP(S) DESCRIPTION..... x F13TT
NUMBER OF LAMPS..... 2
LUMENS EACH..... 900.
NUMBER OF SUBLAYOUTS.... 1

CANDLEPOWER VALUES, IN CANDELAS:
(VALUES SCALED BY ALL FACTORS)

ANGLE FROM NADIR	ANGLE FROM ZERO DEGREE PLANE								
	.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0
.0	830.	830.	830.	830.	830.	830.	830.	830.	830.
5.0	837.	845.	850.	850.	843.	835.	826.	818.	809.
10.0	858.	869.	883.	893.	891.	872.	840.	813.	797.
15.0	883.	893.	931.	987.	990.	954.	880.	816.	794.
20.0	901.	907.	994.	1066.	1067.	1032.	933.	819.	782.
25.0	883.	891.	1008.	1083.	1072.	1050.	962.	816.	755.
30.0	811.	838.	958.	1064.	1046.	1016.	925.	769.	677.
35.0	680.	728.	856.	904.	838.	854.	822.	709.	555.
40.0	523.	587.	722.	654.	597.	598.	662.	590.	459.
45.0	392.	434.	483.	458.	438.	414.	410.	438.	334.
50.0	242.	253.	240.	251.	235.	205.	192.	236.	146.
55.0	104.	101.	82.	66.	67.	59.	60.	75.	35.
60.0	21.	18.	16.	13.	10.	11.	13.	13.	6.
65.0	6.	6.	10.	6.	0.	5.	6.	5.	6.
70.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
75.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
80.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
85.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.

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DESIGN FILE: PA2.DES

SUBLAYOUT NUMBER..... 1
AIMING ANGLES OF LUMINAIRE:
ROTATION OF ZERO DEGREE PLANE.. .00
TILT ANGLE FROM NADIR..... .00
SPIN ANGLE..... .00
X, Y, Z DIMENSIONS ACTUALLY USED.. .58 .58 .00
LUMINOUS SIDES ACTUALLY USED..... NONE
SUSPENSION LENGTH..... .00
NUMBER OF COLUMNS..... 2
NUMBER OF ROWS..... 2

COLUMN
COOR. 63.00 68.00

ROW
COOR. 2.00 7.00

LUMINAIRE NUMBER..... 2
DESCRIPTION..... LAMP CODE : F4CBX/SPX35/RS
FROM DATABASE FILE..... A:\2020PA2Y.IES
DATABASE NUMBER..... 1
TOTAL INPUT WATTS..... 71.0
X, Y AND Z DIMENSIONS... 1.66 1.92 .00
UNITS FOR DIMENSIONS.... FEET
CANDLEPOWER MULTIPLIER.. .80
LAMP(S) DESCRIPTION.....
NUMBER OF LAMPS..... 2
LUMENS EACH..... 3150.
NUMBER OF SUBLAYOUTS.... 1

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DESIGN FILE: PA2.DES

CANDLEPOWER VALUES, IN CANDELAS:
(VALUES SCALED BY ALL FACTORS)

ANGLE FROM NADIR	ANGLE FROM ZERO DEGREE PLANE				
	.0	22.5	45.0	67.5	90.0
.0	711.	711.	711.	711.	711.
5.0	709.	707.	708.	707.	701.
10.0	699.	696.	698.	698.	694.
15.0	675.	676.	678.	681.	677.
20.0	650.	649.	655.	655.	653.
25.0	613.	610.	618.	624.	623.
30.0	572.	574.	579.	589.	590.
35.0	524.	527.	536.	546.	550.
40.0	470.	474.	493.	508.	516.
45.0	416.	415.	442.	468.	479.
50.0	350.	361.	392.	426.	439.
55.0	286.	299.	346.	386.	400.
60.0	221.	247.	294.	344.	360.
65.0	177.	194.	251.	299.	322.
70.0	127.	145.	200.	250.	277.
75.0	86.	93.	146.	202.	232.
80.0	44.	47.	82.	142.	138.
85.0	13.	12.	14.	23.	26.
90.0	0.	0.	0.	0.	0.

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DESIGN FILE: PA2.DES

SUBLAYOUT NUMBER..... 1
AIMING ANGLES OF LUMINAIRE:
ROTATION OF ZERO DEGREE PLANE.. .00
TILT ANGLE FROM NADIR..... .00
SPIN ANGLE..... .00
X, Y, Z DIMENSIONS ACTUALLY USED.. 1.89 1.92 .00
LUMINOUS SIDES ACTUALLY USED..... NONE
SUSPENSION LENGTH..... .00
NUMBER OF COLUMNS..... 2
NUMBER OF ROWS..... 1

COLUMN
COOR. 3.00 49.00

ROW
COOR. 4.50

TOTAL NUMBER OF LUMINAIRES..... 6
TOTAL WATTS INPUT TO LUMINAIRES.. 278.0
TOTAL WATTS PER UNIT AREA..... 441

PHOTOMETRIC AND GEOMETRIC UNITS: ENGLISH

ROOM DIMENSIONS:

EAST-WEST.... 70.00
NORTH-SOUTH.. 9.00
HEIGHT..... 9.00

ROOM SURFACE REFLECTANCES:

SURFACE	REFLECTANCE
NORTH	.50
EAST	.50
SOUTH	.50
WEST	.50
FLOOR	.20
CEILING	.80

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DESIGN FILE: PA2.DES

AVERAGE ROOM SURFACE EXITANCES (lumens/ft^2)

SURFACE	AVERAGE EXITANCE
NORTH	3.31
EAST	5.08
SOUTH	3.09
WEST	5.05
FLOOR	2.18
CEILING	2.43

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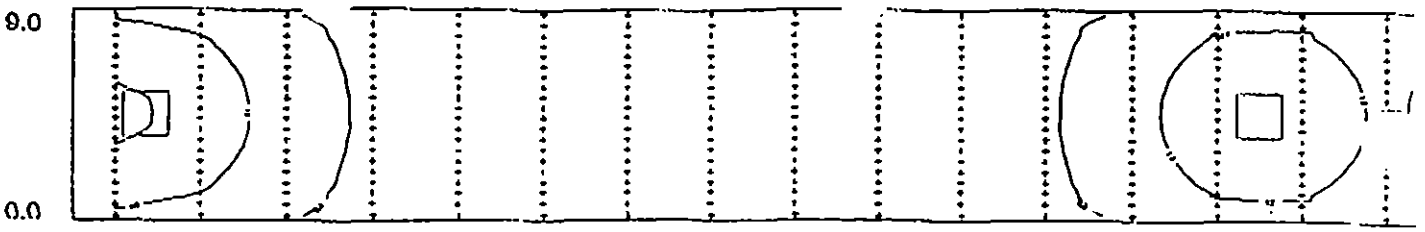
DESIGN FILE: PA2.DES

ILLUMINANCE (footcandles)

WORKING PLANE HEIGHT: 2.50

AVERAGE: 12.9 MINIMUM: 2.07 MAXIMUM: 65.0 MEAN DEVIATION: 10.8

ABS. Y COOR.	ABSOLUTE X-COORDINATE(S)																			
	1.75	5.25	8.75	12.25	15.75	19.25	22.75	26.25	29.75	33.25	36.75	40.25	43.75	47.25	50.75	54.25	57.75	61.25	64.75	68.25
8.77 *	11.0	9.42	5.59	3.49	2.61	2.28	2.12	2.07	2.23	2.30	2.70	3.81	5.88	9.57	9.65	6.80	12.0	29.8	45.9	36.1
8.32 *	12.1	10.7	6.23	3.82	2.86	2.52	2.32	2.28	2.44	2.51	2.95	4.17	6.60	10.9	11.3	7.57	13.1	32.8	50.4	38.1
7.87 *	13.1	11.5	6.49	3.95	2.84	2.49	2.30	2.24	2.34	2.47	2.92	4.13	6.91	11.9	12.1	7.87	13.6	34.4	52.9	39.7
7.42 *	14.3	12.5	6.82	3.99	2.91	2.54	2.35	2.29	2.38	2.53	3.00	4.24	7.30	12.9	13.1	8.28	14.3	35.9	56.4	41.7
6.97 *	15.4	13.4	7.06	4.02	2.90	2.51	2.33	2.27	2.34	2.51	2.99	4.26	7.58	13.9	14.1	8.58	14.9	37.2	57.6	43.4
6.52 *	16.4	14.3	7.31	4.09	2.93	2.53	2.35	2.29	2.35	2.52	3.01	4.33	7.96	14.9	15.0	8.89	15.5	38.5	59.9	45.7
6.07 *	17.5	15.1	7.55	4.17	2.98	2.57	2.39	2.32	2.39	2.56	3.06	4.42	8.16	15.6	15.9	9.20	16.1	39.6	61.9	47.1
5.62 *	18.1	15.7	7.69	4.19	2.98	2.55	2.38	2.32	2.37	2.56	3.07	4.45	8.34	16.5	16.6	9.41	16.4	40.7	63.2	48.4
5.17 *	18.7	16.2	7.84	4.26	3.02	2.59	2.41	2.35	2.41	2.60	3.11	4.51	8.51	17.0	17.1	9.60	16.6	41.4	64.2	49.7
4.72 *	18.9	16.3	7.88	4.26	3.01	2.58	2.40	2.33	2.39	2.58	3.10	4.51	8.56	17.2	17.3	9.66	16.7	41.8	64.7	49.9
4.27 *	18.9	16.3	7.88	4.26	3.01	2.58	2.40	2.33	2.39	2.58	3.10	4.51	8.56	17.2	17.3	9.67	16.6	41.9	65.0	49.8
3.82 *	18.8	16.2	7.88	4.29	3.05	2.62	2.44	2.37	2.43	2.62	3.14	4.54	8.55	17.0	17.2	9.65	16.6	41.8	65.0	49.4
3.37 *	18.1	15.7	7.69	4.20	2.99	2.56	2.38	2.32	2.38	2.56	3.08	4.46	8.34	16.4	16.6	9.42	16.2	41.1	63.9	47.7
2.92 *	17.4	15.1	7.55	4.10	2.99	2.59	2.40	2.33	2.40	2.57	3.07	4.43	8.16	15.7	15.9	9.20	15.7	40.0	62.1	45.8
2.47 *	16.4	14.2	7.31	4.11	2.95	2.54	2.36	2.30	2.36	2.54	3.03	4.34	7.87	14.8	15.0	8.88	15.1	38.4	59.6	43.6
2.02 *	15.3	13.3	7.06	4.04	2.92	2.53	2.35	2.29	2.36	2.52	3.00	4.26	7.58	13.9	14.0	8.55	14.4	36.7	56.9	41.6
1.57 *	14.2	12.5	6.81	4.01	2.93	2.56	2.37	2.31	2.40	2.55	3.02	4.26	7.29	12.9	13.1	8.24	13.9	35.0	54.2	39.6
1.12 *	13.0	11.5	6.50	3.98	2.97	2.61	2.42	2.27	2.37	2.49	2.95	4.15	6.91	11.8	12.0	7.82	13.1	33.0	51.0	37.2
.67 *	12.0	10.6	6.24	3.96	2.89	2.56	2.36	2.31	2.42	2.54	2.98	4.20	6.60	10.9	11.1	7.50	12.5	30.9	47.8	34.9
.22 *	10.9	9.35	5.60	3.52	2.64	2.31	2.15	2.10	2.26	2.33	2.73	3.84	5.85	9.50	9.75	6.73	11.2	27.9	43.2	31.4



0.0

Analysis: Horizontal Illuminance Scale: 0.125 = 1.00

Surface: Grid 1

Design File: PA2

Units: footcandles

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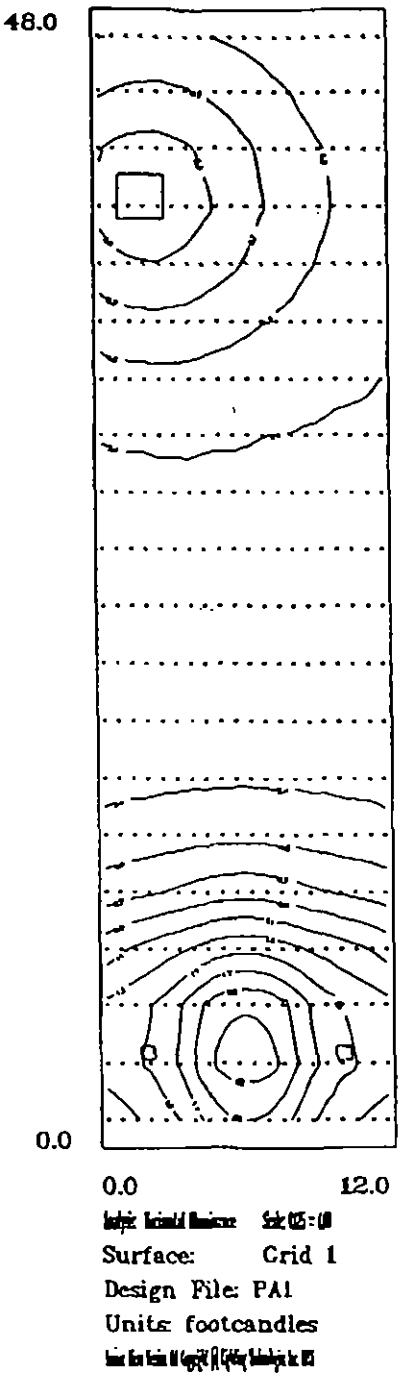
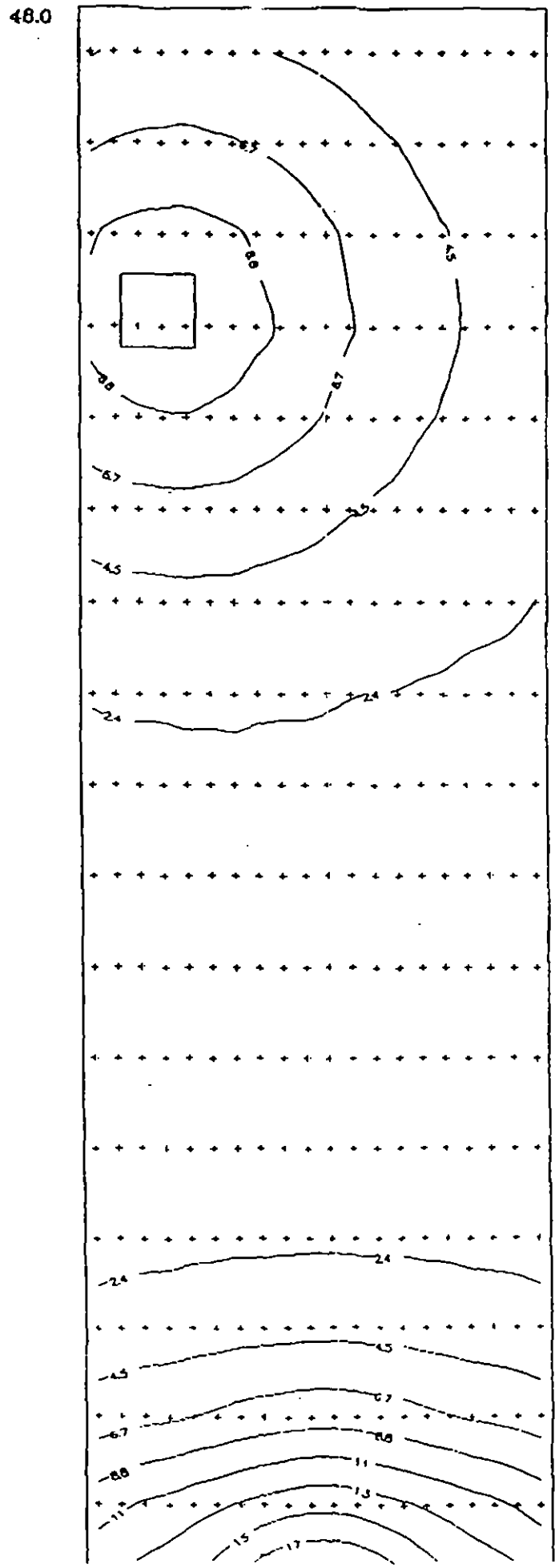
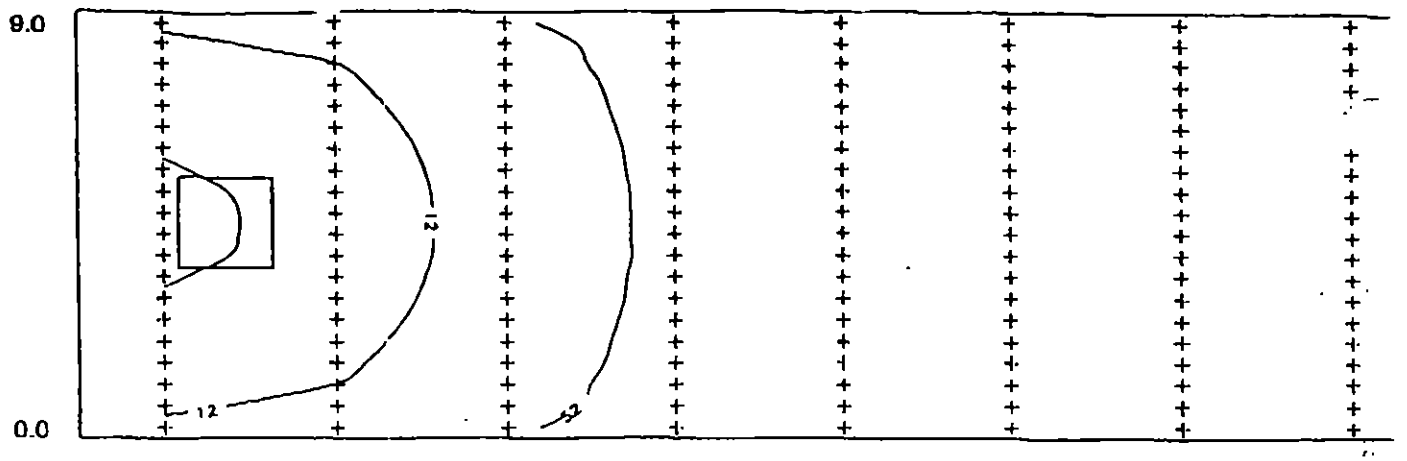


ELEVATOR LOBBY

FEM CONDITION



ELEVATOR LOBBY



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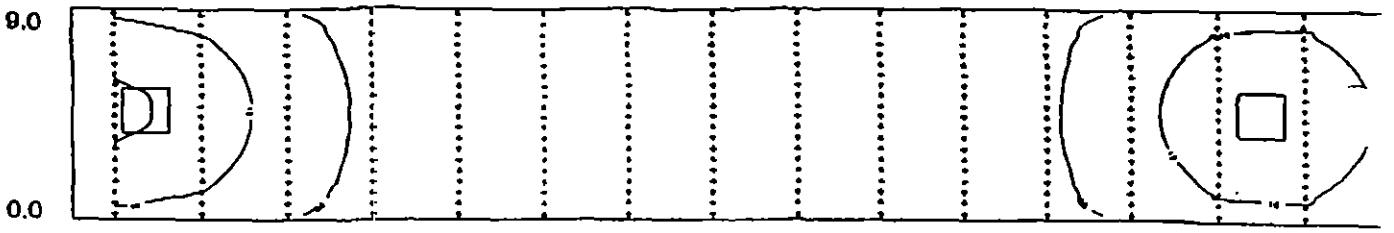
Analysis: Horizontal Illuminance Scale: 0.250 = 1.00
Surface: Grid 1
Design File: PA2
Units: footcandles

CORRIDOR



0.0

Analysis: Horizontal Illuminance Scale: 0.125 = 1.00
Surface: Grid 1
Design File: PA2
Units: footcandles
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CORRIDOR

NORTH

STALLATION PART PLAN

LIGHTING FIXTURE LIST

[illegible]	2	[illegible]	277	[illegible]	SPECIFY 277V BALLAST
[illegible]	2	[illegible]	[illegible]	[illegible]	SPECIFY 120V BALLAST
[illegible]	2	[illegible]	277	[illegible]	SPECIFY 277V [illegible]
[illegible]	2	[illegible]	[illegible]	[illegible]	SPECIFY 120V [illegible]
[illegible]	2	[illegible]	277	[illegible]	SPECIFY [illegible] BALLAST [illegible]
[illegible]	2	[illegible]	277	[illegible]	SPECIFY [illegible] BALLAST [illegible]
[illegible]	-	LED	[illegible] 277	3	ALL SIGNS TO HAVE DIRECTIONAL ARROWS AS SHOWN ON DRAWINGS.
[illegible]	-	LED	[illegible] 277	4	ALL SIGNS TO HAVE DIRECTIONAL ARROWS AS SHOWN ON DRAWINGS.

NOTES:

1. LIGHT FIXTURES MUST BE APPROVED FOR USE IN WTC.
2. WIRE EMERGENCY FIXTURES FOR 120V.
3. INSTALL (2) OFF 5-200 DUPLEX RECEPTACLES IN EACH OF (2) TOILETS, AS INDICATED.
4. "EM" INDICATES LOW VOLTAGE EMERGENCY LIGHTING.
5. WHEN ALL LIGHTING FIXTURES, WITHIN ONE ROOM ARE TO BE CONNECTED TO A SINGLE CIRCUIT (EXCEPT FOR EMERGENCY FIXTURES), THE LIGHTING CIRCUIT NUMBER APPEARS IN A BOX ABOVE THE RECEPTICAL CIRCUIT NUMBER.
6. WHEN ALL RECEPTICALS WITHIN ONE ROOM ARE TO BE CONNECTED TO A SINGLE CIRCUIT THE CIRCUIT NUMBER APPEARS IN A BOX BELOW THE LIGHTING CIRCUIT NUMBER.
7. CIRCUIT ALL INDICATED EM FIXTURES AND EXIT LIGHTS TO [illegible]. THE [illegible] CIRCUIT BREAKER CURRENTLY INSTALLED IN THAT POSITION MUST BE REPLACED WITH A COMPATIBLE [illegible] CIRCUIT BREAKER.

ISSUE FOR 100%
CLIENT REVIEW

THE PORT AUTHORITY OF NY & NJ

SHARE HAGER COWELL ARCHITECTS

World Trade Planning

World Trade Center

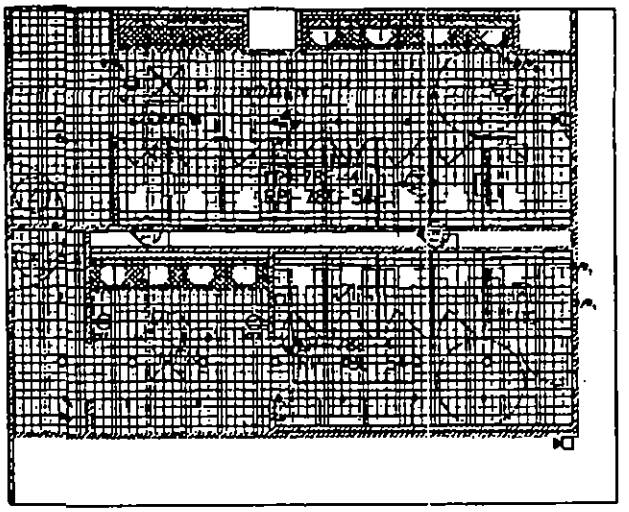
2 WTC
78TH FLOOR
CORRIDOR AND
TOILET UPGRADE

No. Date Revision Approved

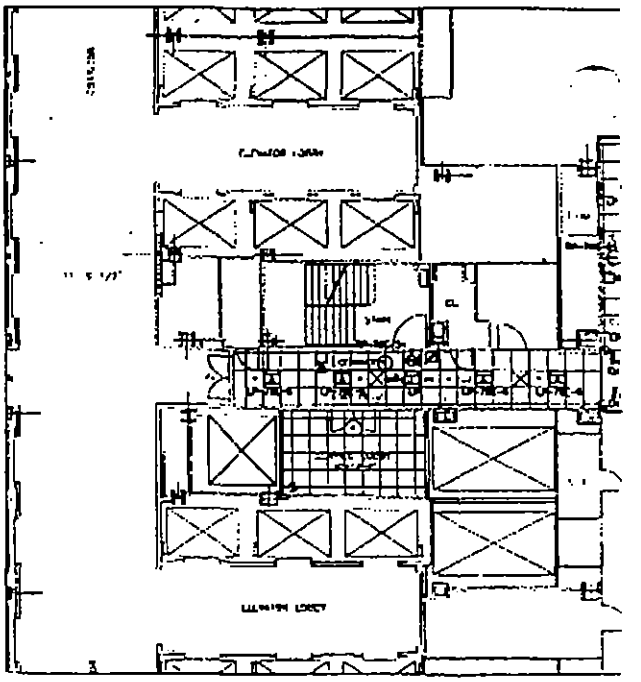
JDO Designed by CB Drawn by Task Leader

4/17/98 Date JDO Checked by Senior Engineer

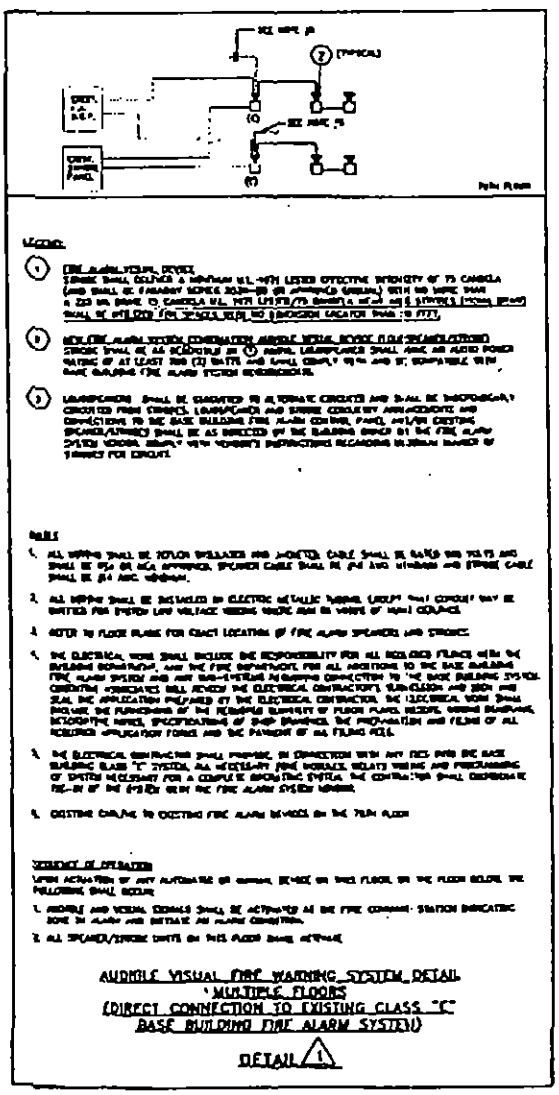
Contract Number Drawing Number E178C



TOILET POWER AND LIGHTING
INSTALLATION PART PLAN
SCALE: 1/4"=1'

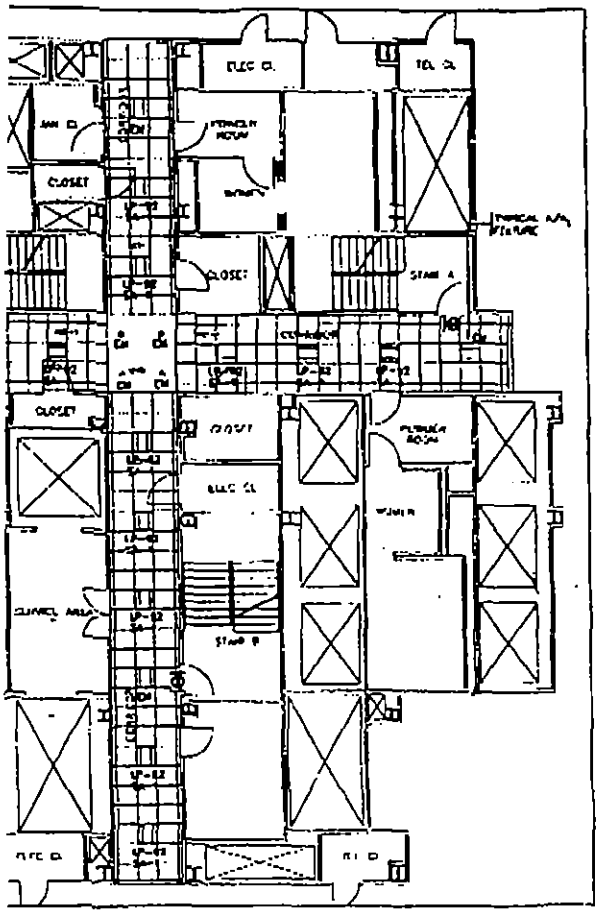


CORRIDOR POWER AND LIGHTING
SCALE: 1/8"=1'



AUDIBLE VISUAL FIRE WARNING SYSTEM DETAIL
MULTIPLE FLOORS
(DIRECT CONNECTION TO EXISTING CLASS "E"
BASE BUILDING FIRE ALARM SYSTEM)
DETAIL 1

E178C



NORTH

NSTALLATION PART PLAN
'=1'

NOTES:

1. LIGHT FIXTURES MUST BE APPROVED FOR USE IN NYC.
2. WIRE EMERGENCY FIXTURES FOR 120V.
3. "EM" INDICATES LOW VOLTAGE EMERGENCY LIGHTING.
4. WIRE EMERGENCY AND EXIT LIGHTS ON THE NEAREST AVAILABLE EMERGENCY CIRCUIT.
5. WIRE LIGHTS AS INDICATED IN 20 AMP CIRCUITS ON THE NEARER 1 AND 3 POLE POSITIONS IN PANEL LP-92SA OR ANY (3) SPARE 20 AMP OR BLANK POLES AVAILABLE IF 1 AND 3 ARE ALREADY USED.

ISSUE FOR BID

THE PORT AUTHORITY OF NY & NJ

World Trade Planning

World Trade Center

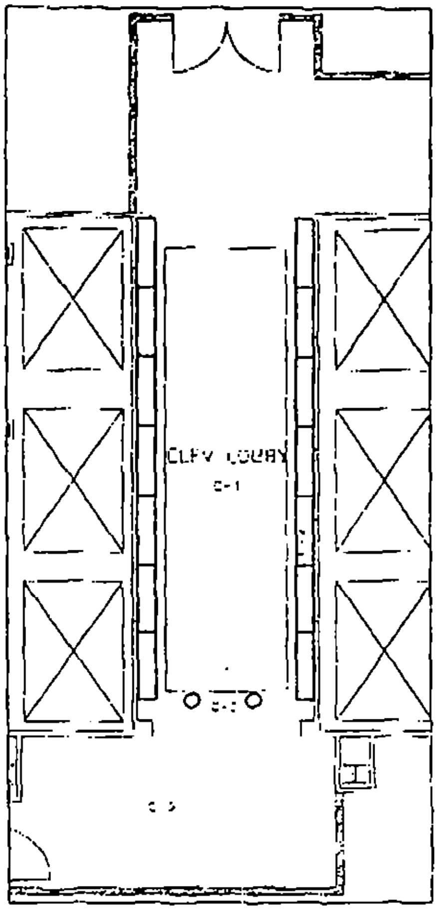
1 WTC
92ND FLOOR
CORRIDOR AND
LOBBY UPGRADE

No.	Date	Revision	Approved

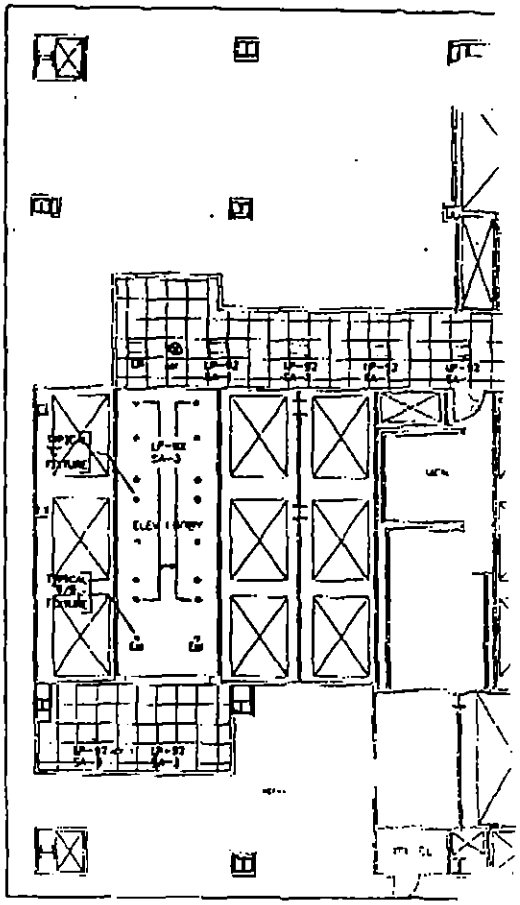
JBD Designed by | CB Drawn by | Team Leader

3/16/98 Date | JBD Checked By | Senior Engineer

Contract Number CWC-868-025 | Drawing Number E192C



DEMOLITION PART PLAN
SCALE:1/4"=1'



LIGHTING
SCALE:1/

NOTES:

1. REMOVE EXISTING LIGHTING FIXTURES AS INDICATED.
2. EXISTING EXIT LIGHTS IN CORRIDORS SHALL BE REMOVED FOR RE USE LATER. (NOT SHOWN)
3. ALL LIGHTING RACEWAYS, JUNCTION BOXES, AND CONDUCTORS HAVE BEEN PREVIOUSLY REMOVED FROM CORRIDORS.
4. RACEWAYS, CONDUCTORS AND JUNCTION BOXES USED TO FEED THE REMAINING EMERGENCY LIGHTS IN THE ELEVATOR LOBBY WILL REMAIN IN PLACE TO BE USED TO FEED REPLACEMENT EMERGENCY LIGHTING IN THE LOBBY, CORRIDORS AND [illegible].

LEGEND

○ INCANDESCENT DOWN LIGHT WITH SCREW IN FLUORESCENT FIXTURES

▭ SINGLE 4' BULB FLUORESCENT FIXTURE

LIGHTING FIXTURE LIST							
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
A	2'x2' RECESSED FLUORESCENT, LAY IN CONCEALED SPLINE FIXTURE	[illegible]	2	F40 [illegible]	277	[illegible]	SPECIFY 277V BALLAST
A1	2'x2' RECESSED FLUORESCENT, LAY IN CONCEALED SPLINE FIXTURE	[illegible]	2	F40 [illegible]	120	[illegible]	SPECIFY 120V BALLAST
B	RECESSED COMPACT FLUORESCENT DOWNLIGHT	EDISON PRICE SUPER DWPLUX [illegible]	2	[illegible]	277	[illegible]	SPECIFY 277V OPERATION
B1	RECESSED COMPACT FLUORESCENT DOWNLIGHT	EDISON PRICE SUPER DWPLUX [illegible]	2	[illegible]	120	[illegible]	SPECIFY 120V OPERATION
C	RECESSED COMPACT FLUORESCENT [illegible]	EDISON PRICE [illegible]	2	[illegible]	277	[illegible]	SPECIFY 277V OPERATION

e792C

****

LUMEN MICRO

****

World Trade Center

Corridor and Lobby Upgrade

Elevator Lobby Emergency Lighting Analysis

REPORT FOR:

The Port Authority

REPORT BY:

SM

Cosentini Associates

VERSION 6.0

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2540 FRONTIER AVE. SUITE #107, BOULDER, CO. 80301

Cosentini Associates
LUMEN MICRO VERSION 6.0
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DESIGN FILE: PAL.DES

ROOM CHARACTERISTICS

LUMINAIRE DESCRIPTION(S):

LUMINAIRE NUMBER..... 1
DESCRIPTION..... Direct recessed compact fluorescent downlight, 8" round
FROM DATABASE FILE..... C:\LMVS\IES\EPL93\COMPFLU\BAF&COL.IES
DATABASE NUMBER..... 1
TOTAL INPUT WATTS..... 34.0
X, Y AND Z DIMENSIONS... .58 .58 .00
UNITS FOR DIMENSIONS.... FEET
CANDLEPOWER MULTIPLIER.. 1.60
LAMP(S) DESCRIPTION..... x F13TT
NUMBER OF LAMPS..... 2
LUMENS EACH..... 900.
NUMBER OF SUBLAYOUTS.... 1

CANDLEPOWER VALUES, IN CANDELAS:
(VALUES SCALED BY ALL FACTORS)

ANGLE FROM NADIR	ANGLE FROM ZERO DEGREE PLANE								
	.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0
.0	830.	830.	830.	830.	830.	830.	830.	830.	830.
5.0	837.	845.	850.	850.	843.	835.	826.	818.	808.
10.0	858.	869.	883.	893.	891.	872.	840.	813.	797.
15.0	883.	893.	931.	967.	990.	954.	860.	816.	794.
20.0	901.	907.	994.	1066.	1067.	1012.	933.	819.	782.
25.0	903.	891.	1008.	1063.	1072.	1050.	962.	816.	755.
30.0	811.	838.	958.	1064.	1046.	1014.	925.	789.	677.
35.0	680.	728.	856.	904.	930.	954.	822.	709.	555.
40.0	523.	587.	722.	684.	697.	598.	662.	590.	459.
45.0	392.	434.	483.	458.	438.	414.	418.	438.	334.
50.0	242.	253.	240.	251.	235.	205.	152.	238.	146.
55.0	104.	101.	82.	66	67.	59	50.	75.	35.
60.0	21.	18.	16.	13.	10.	11.	13.	13.	6.
65.0	6.	6.	10.	6	6	5.	6.	5.	6.
70.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
75.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
80.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
85.0	0.	0.	0.	0.	0.	0	0.	0	0.
90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.

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DESIGN FILE: PA1.DES

SUBLAYOUT NUMBER..... 1
AIMING ANGLES OF LUMINAIRE:
ROTATION OF ZERO DEGREE PLANE.. .00
TILT ANGLE FROM NADIR..... .00
SPIN ANGLE..... .00
X, Y, Z DIMENSIONS ACTUALLY USED.. .58 .58 .00
LUMINOUS SIDES ACTUALLY USED..... NONE
SUSPENSION LENGTH..... .00
NUMBER OF COLUMNS..... 2
NUMBER OF ROWS..... 1

COLUMN
COOR. 2.00 10.00

ROW
COOR. 4.00

LUMINAIRE NUMBER..... 2
DESCRIPTION..... LAMP CODE : F4CBX/SPX35/RS
FROM DATABASE FILE..... A:\202DRAZY.IES
DATABASE NUMBER..... 1
TOTAL INPUT WATTS..... 71.0
X, Y AND Z DIMENSIONS... 1.88 1.92 .00
UNITS FOR DIMENSIONS.... FEET
CANDLEPOWER MULTIPLIER.. .80
LAMP(S) DESCRIPTION.....
NUMBER OF LAMPS..... 2
LUMENS EACH..... 3150.
NUMBER OF SUBLAYOUTS.... 1

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DESIGN FILE: PA1.DES

CANDLEPOWER VALUES, IN CANDELAS:
(VALUES SCALED BY ALL FACTORS)

ANGLE FROM NADIR	ANGLE FROM ZERO DEGREE PLANE				
	.0	22.5	45.0	67.5	90.0
.0	711.	711.	711.	711.	711.
5.0	709.	707.	708.	707.	701.
10.0	699.	696.	698.	698.	694.
15.0	676.	676.	678.	681.	677.
20.0	650.	649.	655.	655.	653.
25.0	613.	610.	618.	624.	623.
30.0	572.	574.	579.	589.	590.
35.0	524.	527.	536.	546.	550.
40.0	470.	474.	493.	508.	516.
45.0	416.	415.	442.	468.	479.
50.0	350.	361.	392.	426.	438.
55.0	286.	299.	346.	346.	400.
60.0	221.	247.	294.	344.	360.
65.0	177.	194.	251.	299.	322.
70.0	127.	145.	200.	250.	277.
75.0	86.	93.	146.	202.	232.
80.0	44.	47.	92.	132.	138.
85.0	13.	12.	14.	23.	26.
90.0	0.	0.	0.	0.	0.

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DESIGN FILE: PA1.DES

SUBLAYOUT NUMBER..... 1
AIMING ANGLES OF LUMINAIRE:
ROTATION OF ZERO DEGREE PLANE.. .00
TILT ANGLE FROM NADIR..... .00
SPIN ANGLE..... .00
X, Y, Z DIMENSIONS ACTUALLY USED.. 1.89 1.92 .00
LUMINOUS SIDES ACTUALLY USED..... NONE
SUSPENSION LENGTH..... .00
NUMBER OF COLUMNS..... 1
NUMBER OF ROWS..... 1

COLUMN
COOR. 2.00

ROW
COOR. 40.00

TOTAL NUMBER OF LUMINAIRES..... 3
TOTAL WATTS INPUT TO LUMINAIRES.. 119.0
TOTAL WATTS PER UNIT AREA..... .241

PHOTOMETRIC AND GEOMETRIC UNITS: ENGLISH

ROOM DIMENSIONS:

EAST-WEST.... 12.00
NORTH-SOUTH.. 48.00
HEIGHT..... 9.00

ROOM SURFACE REFLECTANCES:

SURFACE	REFLECTANCE
NORTH	.50
EAST	.50
SOUTH	.50
WEST	.50
FLOOR	.20
CEILING	.80

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DESIGN FILE: PA1.DES

AVERAGE ROOM SURFACE EXITANCES (lumens/ft^2)

SURFACE	AVERAGE EXITANCE
NORTH	1.60
EAST	1.85
SOUTH	2.80
WEST	2.26
FLOOR	1.26
CEILING	1.37

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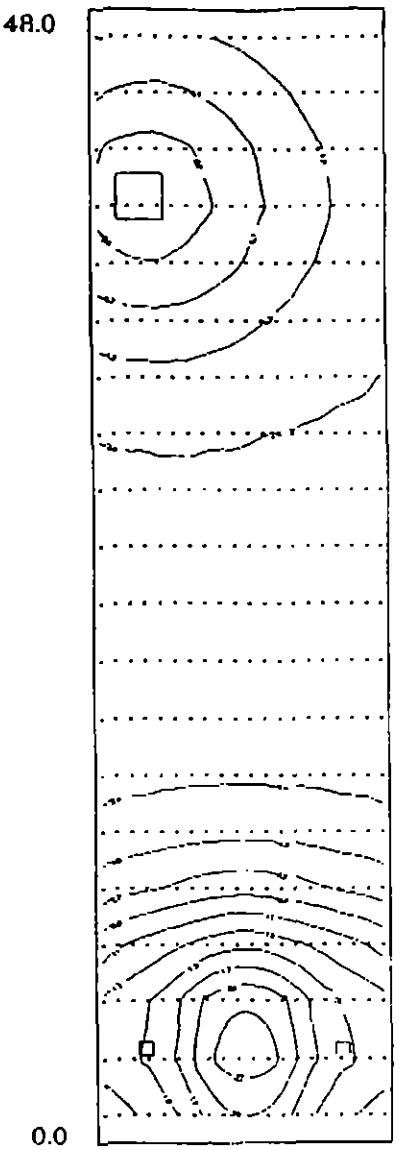
DESIGN FILE: PA1.DES

ILLUMINANCE (footcandles)

WORKING PLANE HEIGHT: .00

AVERAGE: 6.20 MINIMUM: 1.30 MAXIMUM: 22.8 MEAN DEVIATION: 4.37

ABS. Y COOR.	ABSOLUTE X-COORDINATE(S)																		
	.30	.90	1.50	2.10	2.70	3.30	3.90	4.50	5.10	5.70	6.30	6.90	7.50	8.10	8.70	9.30	9.90	10.50	11.10	11.70
46.80	4.43	4.65	4.76	4.84	4.94	4.89	4.79	4.64	4.48	4.31	4.12	3.92	3.71	3.54	3.33	3.21	3.00	2.85	2.73	2.57
44.40	6.43	6.76	6.95	7.04	7.10	6.97	6.81	6.54	6.24	5.92	5.57	5.19	4.84	4.56	4.21	3.97	3.69	3.48	3.29	3.05
42.00	8.66	9.15	9.41	9.52	9.56	9.34	9.07	8.59	8.09	7.56	7.00	6.43	5.88	5.45	4.97	4.63	4.27	3.99	3.75	3.45
39.60	9.39	9.94	10.2	10.4	10.4	10.1	9.81	9.27	8.69	8.09	7.47	6.83	6.21	5.74	5.21	4.84	4.45	4.14	3.88	3.55
37.20	7.94	8.37	8.60	8.70	8.75	8.55	8.33	7.91	7.47	7.02	6.53	6.01	5.53	5.16	4.78	4.42	4.08	3.82	3.60	3.31
34.80	5.59	5.87	5.98	6.04	6.11	6.00	5.92	5.67	5.44	5.21	4.93	4.63	4.35	4.14	3.85	3.65	3.42	3.26	3.12	
32.40	3.66	3.82	3.88	3.91	3.96	3.94	3.93	3.81	3.70	3.62	3.49	3.33	3.19	3.11	2.95	2.85	2.70	2.62	2.53	2.37
30.00	2.47	2.57	2.59	2.60	2.66	2.64	2.67	2.60	2.56	2.55	2.49	2.41	2.35	2.34	2.25	2.21	2.12	2.09	2.05	1.94
27.60	1.87	1.90	1.90	1.89	1.94	1.94	1.98	1.93	1.92	1.94	1.92	1.87	1.85	1.86	1.81	1.80	1.74	1.74	1.74	1.72
25.20	1.45	1.54	1.56	1.64	1.69	1.69	1.63	1.60	1.60	1.63	1.62	1.59	1.56	1.61	1.57	1.56	1.51	1.52	1.51	1.46
22.80	1.32	1.37	1.38	1.37	1.41	1.42	1.45	1.42	1.43	1.46	1.46	1.43	1.42	1.45	1.42	1.42	1.37	1.39	1.38	1.34
20.40	1.31	1.32	1.32	1.30	1.34	1.34	1.38	1.36	1.35	1.39	1.39	1.35	1.35	1.38	1.35	1.35	1.32	1.33	1.34	1.34
18.00	1.31	1.37	1.38	1.37	1.42	1.43	1.47	1.44	1.45	1.48	1.48	1.45	1.45	1.48	1.44	1.43	1.38	1.39	1.39	1.33
15.60	1.73	1.83	1.86	1.88	1.95	1.97	2.04	2.02	2.04	2.00	2.08	2.04	2.03	2.04	1.99	1.96	1.89	1.87	1.84	1.74
13.20	2.58	3.14	3.22	3.30	3.46	3.56	3.71	3.76	3.82	3.89	3.89	3.83	3.77	3.72	3.58	3.44	3.32	3.23	3.16	2.98
10.80	5.54	5.88	6.13	6.28	6.70	6.92	7.34	7.56	7.80	7.95	7.95	7.81	7.59	7.36	7.01	6.73	6.41	6.17	5.92	5.57
8.40	9.97	10.7	11.2	11.7	12.3	12.8	13.4	13.9	14.3	14.6	14.6	14.4	13.9	13.4	12.8	12.4	11.8	11.3	10.9	10.3
6.00	13.5	14.0	14.5	15.1	16.0	17.1	18.6	20.0	21.1	21.4	21.4	21.1	20.1	18.7	17.2	16.1	15.3	14.7	14.2	13.4
3.60	14.0	14.5	15.0	15.6	16.5	17.7	19.5	21.3	22.5	22.8	22.8	22.5	21.3	19.6	17.9	16.7	15.8	15.3	14.8	
1.20	12.0	12.5	13.0	13.6	14.5	15.4	16.7	18.1	19.1	19.6	19.6	19.1	18.1	16.8	15.5	14.6	13.8	13.2	12.7	12.



Surface: Grid 1
Design File: PA1
Units: footcandles

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY

M E M O R A N D U M

To: Mr. Lou Menno, General Manager, World Trade Tenant Services
From: C. John Lin, P.E.
Date: May 11, 1998
Subject: **WTC - ALTERATION APPLICATION W-981121 - PANYNJ - 1 WTC, 92ND FLOOR - CORRIDOR AND LOBBY UPGRADE**

Reference: Review Request dated 4/27/98

Copy To: A. Fadavi, G. Gaeta, T. O'Connor, J. Napolitano, Job Folder, Chrono Folder

A review of the material submitted with the referenced request has been made.

It is recommended that **approval** to proceed with construction be given subject to the **submission** of the items listed below being **revised** in accordance with the **five (5) requirements** listed on the attached rider.

Drawings:

Specifications: Calculations:

REMARKS: 1) Copies of Figure 10-3 and Drawing SP-9 referred to in Comment 2(b)(i) and Comment 4, respectively, will be sent with the signed copy of this memorandum.

2) See the attachment for a revised list of drawings recommended for approval.

3) This memorandum was transmitted to the Facility via OA on May 11, 1998.

for C. John Lin, P.E.
Acting Manager
Quality Assurance Division

I.D.: W98-1121-002
TSM/al
att.

Reviewers:
T. Santa Maria, Electrical and Coordinator; Z.A. Zwierz, Mechanical; R. Lee, Structural; D. Luey, Fire Protection.

RIDER

ALTERATION APPLICATION W-981121

GENERAL

1. All design documents such as drawings, computations, and specifications shall be sealed and signed by the Architect or Engineer of Record licensed to practice in the State of New York.

ELECTRICAL

2. Drawing E192C. The response to Comment 1 of the previous Rider is noted. Two (2) printouts of iso footcandle curves, Design File PA1 (EXHIBIT 1) and Design File PA2 (EXHIBIT 2) representing the Elevator Lobby and the Corridor, respectively, were submitted. Also submitted is a printout, Design File PA2.des (herein designated as EXHIBIT 3) showing levels of illumination along the Corridor during normal conditions:

   a) EXHIBIT 3 shows an average illumination of 12.9 fc and a minimum of 2.07 fc but EXHIBIT 1 and EXHIBIT 2 show that the levels of illumination drops to zero (no levels of illumination are shown) between the emergency fixtures. Please clarify, and submit printout of levels of illumination similar to EXHIBIT 3, but under emergency condition with the average and minimum levels of illumination indicated.

   b) The levels of illumination submitted could not be verified since the following were not submitted, as requested in the previous Rider:

      i) Submit the photometric data for each type of emergency fixtures used, including a typical candlepower distribution curve for each. See Figure 10-3.

      ii) Submit information and/or data used in calculating/ verifying the levels of illumination.

   c) On Drawing (E192C), show the specific type of fixtures to be used. The emergency fixtures are designated as B/B1 and A/A1. Please be specific.

   d) EXHIBIT 1 and EXHIBIT 2. Please indicate on the printout the following: fixture type, manufacturer, lamp designation, volt and volt-ampere (e.g., type A1, Neoray Fenestra 202/bx, F403bxspx35GE, 120V, 80 VA).

   e) EXHIBIT 1 and EXHIBIT 2. Please indicate on the printout all the computer input data used in calculating the levels of illumination.

W-981121 (cont'd)

MECHANICAL

3. Drawing M-1.01, Details of Methods of Hanging Ductwork. In this detail, specify the maximum distances between duct hangers as well as the minimum sizes of duct hanger straps in conformance with NYC Building Code RS 13-1, Section 2-1.1.2.3(a).(3), (4), and (5). Note that Section 2-1.1.2.3(a).(4) contains typographical error indicating the minimum hanger sizes as 1 inch by 1/18 inch, instead of 1 inch by 1/8 inch. (Repeat comment)

FIRE PROTECTION

4. Drawing SP-102. Show all new and existing sprinkler piping and sizes in the area of work. See attached Drawing SP-9 (2 sheets). (Modified repeat comment)

5. Technical Specifications Division 15 (Sections 15300 and 15500) are missing. Please submit for review. (Modified repeat comment)

ATTACHMENT

ALTERATION APPLICATION W-981121

Subject to compliance with the requirements listed in this memorandum's rider, the following is a revised list of drawings recommended for approval:

Drawing		
T-1	dated	3/16/98
T-2	dated	3/16/98
A-1	dated	3/16/98
A-2	dated	3/16/98
A-3	dated	3/16/98
E192K	dated	3/16/98
E192C	dated	3/16/98
M-1.0	dated	3/16/98
M-1.01	dated	3/16/98
SP-102	dated	2/13/98

The Port Authority of NY & NJ

To: T. Santa Maria
From: Danny Luey
Date: April 30, 1998

Subject: Tenant Alterations Review Request
Application No. W98-1121 #2
Fire Protection Comments

1. General: The electrical, mechanical and sprinkler design documents, such as drawings, computations, and specifications, shall be sealed and signed by the architect of record licensed to practice in New York State or acknowledged consultant. (modified repeat comment)

2. Drawing No. SP-102: Show all new and existing sprinkler piping and sizes in area of work. See attached drawing. (modified repeat comment)

3. Technical Specification division 15 (sections 15300 and 15500) are missing. Submit for review. (modified repeat comment)

The Port Authority of NY & NJ

To: S. Sharma
From: Danny Luey
Date: February 25, 1998

Subject: Tenant Alterations Review Request
Application No. W98-1121 #1
Fire Protection Comments

1. General: The design documents, such as drawings, computations, and specifications, shall be sealed and signed by the architect of record licensed to practice in New York State or acknowledged consultant.

2. Drawing No. SP-102:

   a. Show all new and existing sprinkler piping and sizes in area of work.

   b. Add "Concealed sprinkler heads shall be chrome plated, 1/2" orifice with a 165°F temperature rating.

3. Technical Specification division 15 (sections 15300, 15400, and 15600) are missing. Submit for review.

Reviewer: **Z. Andrew Zwierz**
Coordinator: **T. Santa Maria**
Date: **05/04/98**

PANYNJ – 1 WTC – 92ND Floor
Corridor and Lobby Upgrade - **WTC**
W2-405-083-200.444

EW98-1121-001

MECHANICAL

_. Drawing M-1.01, Detail of Methods of Hanging Ductwork. In this detail specify the maximum distances between duct hangers as well as the minimum sizes of duct hanger straps in conformance with NYC Building Code RS 13-1, Sections 2-1.1.2.3.(a).(3), (4), and (5). Note, that Section 2-1.1.2.3.(a).(4) contains typographical error indicating the minimum hanger size as 1 in. by 1/18th in. instead of 1 in. by 1/8th in. (Repeat comment)

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY
ENGINEERING DEPARTMENT - DESIGN DIVISION TAA REVIEW REQUEST

To: D. LUEY (Reviewer) Location: 745

From: QAD DESIGN STANDARDS Date: 4/28/98

TAA # W98-1121-002 (Submission #) Facility: 1 WTC/92

Tenant: WTD Rec'd. Date: 4/28/98

Description of Work: CORRIDOR UPGRADE

Charge Code: W2-X-X-200.444

Review Disciplines

- [ ] Architectural
- [ ] Structural
- [ ] HVAC
- [ ] Plumbing
- [x] Fire Protection/ Sprinklers/Etc.
- [ ] Electrical/Metering
- [ ] Utility> 600 V/ 5 KV
- [ ] Civil
- [ ] Geotechnical
- [ ] Environmental/Asbestos Abatem't.
- [ ] Fueling
- [ ] Radio Frequency Coordination
- [ ] Corrosion Protection
- [ ] Elevator/Escalator
- [ ] Traffic
- [ ] Other(specify)_____

Attachments

- [ ] Document List
- [x] Contract Drawings
- [x] Contract Specifications
- [x] Tenant Response
- [ ] Calculations
- [ ] Catalog Cuts
- [ ] Reports
- [ ] Certifications
- [ ] Previous Rider
- [ ] Other (specify)_____

Special Instructions

SPECS NOT SUBMITTED

Reviewer Information

Name Danny Luey
Date started April 29, 1998
Date completed April 30, 1998
Review time(days) ___
New comments ___
Repeat comments 3

DUE DATE: 5/4/98

Please notify the COORDINATOR if you cannot complete the review by the due date.

Please review the attached submittal; FAX and send your written comments to the following COORDINATOR:

Name: T. SANTA MARIA Location: 51N

Phone #:(212) 435-81009 FAX #: (212) 435-2069*

* If responding by fax, please advise coordinator in advance at telephone number indicated. (Note new fax number).

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY
ENGINEERING DEPARTMENT - DESIGN DIVISION TAA REVIEW REQUEST

To: D. LUEY (Reviewer) Location: 745

From: QAD DESIGN STANDARDS Date: 4/28/98

TAA # W98-1121-002 (Submission #) Facility: 1 WTC/52

Tenant: WTD Rec'd. Date: 4/28/98

Description of Work: CORRIDOR UPGRADE

Charge Code: W2-X-Y-200.444

Review Disciplines

- [ ] Architectural
- [ ] Structural
- [ ] HVAC
- [ ] Plumbing
- [x] Fire Protection/ Sprinklers/Etc.
- [ ] Electrical/Metering
- [ ] Utility> 600 V/ 5 KV
- [ ] Civil
- [ ] Geotechnical
- [ ] Environmental/Asbestos Abatem't.
- [ ] Fueling
- [ ] Radio Frequency Coordination
- [ ] Corrosion Protection
- [ ] Elevator/Escalator
- [ ] Traffic
- [ ] Other(specify)_____

Attachments

- [ ] Document List
- [x] Contract Drawings
- [ ] Contract Specifications
- [x] Tenant Response
- [ ] Calculations
- [ ] Catalog Cuts
- [ ] Reports
- [ ] Certifications
- [ ] Previous Rider
- [ ] Other (specify)_____

Special Instructions

SPECS NOT SUBMITTED

Reviewer Information

Name_____
Date started _____
Date completed _____
Review time(days) ___
New comments ___
Repeat comments ___

DUE DATE: 5/4/98

Please notify the COORDINATOR if you cannot complete the review by the due date.

Please review the attached submittal; FAX and send your written comments to the following COORDINATOR:

Name: T. SANTA MARIA Location: 51N

Phone #:(212) 435-8609 FAX #: (212) 435-2069*

* If responding by fax, please advise coordinator in advance at telephone number indicated. (Note new fax number).

PA 1 5/11

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
TENANT ALTERATION APPLICATION REVIEW REQUEST

DISTRIBUTION		
No	To	Facility
4	QAD	51 N
1	D. Warren	PATC ZIP43
1	S.P. Chiao	88-S
1	G. Daly	88-S
2	S. Batra	2WTC 37FL
1	C. Bonacci	2WTC 35FL

Facility One FLR 92nd TAA No. 981-121 Date 4/27/98

Application / Tenant Corridor Upgrade

Consultant Swanke Hayden

Estimated Cost $150,000 Submittal No. Three

Description of Work Corridor Upgrade

Please review the attached (revised) application and send comments to:

Name: Jennifer Richardson

Location: 1 WTC - 88 - South Phone: 435-2014

5/4/98 DUE DATE

DESIGN DISCIPLINES	ATTACHMENTS	DESCRIPTION
☐ Architectural	☑ Document List	RCVD 4/28
☐ Egress Analysis	☑ Contract Drawings	NO TO 5 DAY REV
☐ Structural	☐ Contract Specifications	10 DAYS
☐ HVAC	☑ Tenant Response	AS PER
☐ Plumbing	☐ Computations	RP
☐ Sprinkler	☐ Reports	
☐ Electrical	☐ Catalog Cuts	
☐ Utility > 600 V	☐ Other	
☐ Civil		
☐ Geotechnical		
☐ Environmental		
☐ Fueling		
☐ Radio Freq. Coord.		
☐ Corrosion Protection		
☐ Elevator / Escalator		
☐ Other_____		

Special Instructions Please Review in 5 days

Copy To: G. Gaeta, J. Napolitano, E. Monteverde, N. Seliga

THE PORT AUTHORITY ENGINEERING DEPT. CIVIL DESIGN STANDARDS (Proj. Mgr.)

APR 28 1998
W98-1121 (2)
RECEIVED
ALTERATIONS APPLICATION
TENANT CONSTRUCTION ...

THE PORT AUTHORITY OF NY ...
QUALITY ASSURANCE DIV.
ENGINEERING DEPT.
Signature

APR 28 1998
W98-1121 (2)
RECEIVED
NOTED:
REFERRED TO:

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form:gertler/TAA/review - revised 3/3/98

INDEX OF DRAWINGS

3/16 T-1 TITLE SHEET
T-2 LIST OF ABBREVIATIONS, INDEX OF DRAWINGS DWG. CONVENTIONS, GENERAL NOTES

ARCHITECTURAL

A-1 DEMOLITION PLAN, LEGEND & NOTES
A-2 CONSTRUCTION PLAN, REFLECTED CEILING PLAN, LEGENDS & NOTES
A-3 ELEVATIONS, PARTITION TYPES, MISC. DETAILS & SCHEDULES

ELECTRICAL

E-192K 92ND FLOOR KEY PLAN / SYMBOL LIST
E-192C CONSTRUCTION / DEMOLITION PLAN

MECHANICAL

M-1.00 92ND FLOOR DEMOLITION PLAN
M-1.01 92ND FLOOR NEW HVAC DUCTWORK PLAN

SPRINKLER

2/13 SP-102 92ND FLOOR SPRINKLER PLAN

THE PORT AUT...
ENGINEERING DEPT...
DESIG...
APR 2 8 1996
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ALTERATIONS ...
TENANT CONSTRUCTION ...

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DRAWING CONVENTIONS

DIVISION 12 (Not Used)

DIVISION 13 (Not Used)

DIVISION 14 (Not Used)

DIVISION 15

15300 - Sprinklers
15500 - HVAC

DIVISION 16

16000 - Electrical

END OF TABLE OF CONTENTS

RIDER

ALTERATION APPLICATION W-981121

ELECTRICAL

1. Drawing E192C. Five (5) 2'x2' emergency lighting fixtures are shown in the corridors, four (4) compact fluorescent downlights at the intersection of the corridors, and another four (4) at the Elevator Lobby. Please verify that in the event of failure of normal lighting, these arrangements of emergency lighting fixtures will provide at least 2 foot-candles of illumination measured at the floor level along the full length of the corridors at Elevator Lobby, at changes in direction and at the intersection of corridors. If calculations indicate inadequate levels of illumination at certain part(s) of the corridors and the Elevator Lobby, the design shall be revised accordingly. Please submit the photometric data for all emergency lighting fixtures, and other related information that were used in calculating/verifying the levels of illumination. Also, please submit a typical calculation of the levels of illumination. See NYC Building Code Section 27-381.

MECHANICAL

2. Drawing M-1.01. Where the existing corridor supply air ducts penetrate shaft walls indicate existing or, if required, provide new fire dampers and access doors, in conformance with NYC Building Code RS 13-1, Section 3-3.2.1.

3. Drawing M-1.01. Provide installation detail of duct hanging methods to be used in this design. In this detail specify the maximum distances between duct hangers as well as the minimum sizes of duct hanger straps in conformance with NYC Building Code RS 13-1, Sections 2.1.1.2.3.(a).(3), (4),a nd (5). Note, that Section 2-1.1.2.3.(a).(4) contains typographical error indicating the minimum hanger size as 1-inch by 1/18th inch instead of 1 inch by 1/8th inch.

STRUCTURAL

4. Drawing A-1. Please add a note that demolition work shall be in compliance with Article 6, Subchapter 19 of the NYC Building Code "Demolition Operations". REVISED ACCORDINGLY.

5. Drawing A-3, New Suspended Ceiling System. Details S3 through S6 are noted. Please add notes for ceiling work in the trussed areas of the WTC, as per PANYNJ Tenant Construction Review Manual, Attachment S2. These notes shall govern requirements of all material and attachments of the new ceiling system. REVISED ACCORDINGLY.

ENGINEERING DEPT.
APR 26 1998
W98-1121 (2)
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ALTERATIONS APPLICATION
TENANT CONSTRUCTION REVIEW

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W-981121 (cont'd)

FIRE PROTECTION

6. Drawing SP-102:

   a) Show all new and existing sprinkler piping and sizes in the area of work.

   b) Add the following note: "Concealed sprinkler heads shall be chrome plated, 1/2" orifice with 165°F temperature rating."

7. Technical Specification Division 15 (Sections 15300, 15400, and 15600) are missing. Submit for review.

Section 15300 - Sprinklers is included.
" 15400 - Plumbing - N.I.C.
" 15600 should be 15500 - HVAC
there is no 15600 on this project

note: Table of contents of Technical specifications to be revised.

030398

ATTACHMENT

ALTERATION APPLICATION W-981121

Subject to compliance with the requirements listed in this memorandum's rider, the following is a list of drawings recommended for approval:

Drawing		
T-1	dated	02/13/98
T-2	dated	02/13/98
A-1	dated	02/13/98
A-2	dated	02/13/98
A-3	dated	02/13/98
E192K	dated	02/13/98
E192C	dated	02/13/98
M-1.00	dated	02/13/98
M-101	dated	02/13/98
M-102	dated	02/13/98

030398

COSENTINI ASSOCIATES LP ■ O PENN. PLAZA, NEW YORK, NY 101_ - 212-615-3600 ■ FAX 212-615-3700

OFFICE MEMORANDUM

TO: Ms. Nancy Walks

FROM: Mr. Jason Daly

CC: Mr. John Jappan/SHC
Mr. Pete Costa/CA
Mr. Phil Cebulski/CA

SUBJECT: WTC Upgrade

JOB NO: 1471-2

DATE: March 13, 1998

Enclosed please find our response to the Port Authority's comments regarding the corridor upgrade project with respect to the second floor MEP design documents.

Also, enclosed please find MEP design documents issued for bid March 16, 1998.

X:\WP\FILES\1471-2.98\JDH\K0313.M01

THE PORT AUTHORITY OF
ENGINEERING DEPT. QUALITY &
DESIGN STANDARDS
APR 28 1998
W98-1121 (2)
RECEIVED
ALTERATIONS APPLICATION
TENANT CONSTRUCTION REVIEW

OFFICE COPY

MECHANCIAL

1. Drawing M1.01 - Will comply

2. Drawing M1.01 - Will comply

WORLD TRADE CENTER
92ND FLOOR - SPRINKLER PART PLAN

DWG. SP-102

1. We need as-built dwg. to show all existing piping in scope of work.

2. See sprinkler specification.

ELECTRICAL

1. Attached please find our "worse case" lighting calculations, performed in locations that were coordinated with Mr. Santomaria of the Port Authority, which shows the current arrangement of emergency lighting complies with New York City Building Code Section 27-381.

   Please note that Mr. Santomaria agrees with the current New York City Building Department interpretation of that section of the code, issued January 20, 1987, (also attached) which states emergency lighting must provide at least two (2) foot candles **average** minimum illumination measured at 18 inches above the floor level and no less than ½ a foot candle in any given location. The attached calculations will serve as typical for all of the upgrade work to follow.

RIDER

ALTERATION APPLICATION W-981121

ELECTRICAL

1. Drawing E192C. Five (5) 2'x2' emergency lighting fixtures are shown in the corridors, four (4) compact fluorescent downlights at the intersection of the corridors, and another four (4) at the Elevator Lobby. Please verify that in the event of failure of normal lighting, these arrangements of emergency lighting fixtures will provide at least 2 foot-candles of illumination measured at the floor level along the full length of the corridors at Elevator Lobby, at changes in direction and at the intersection of corridors. If calculations indicate inadequate levels of illumination at certain part(s) of the corridors and the Elevator Lobby, the design shall be revised accordingly. Please submit the photometric data for all emergency lighting fixtures, and other related information that were used in calculating/verifying the levels of illumination. Also, please submit a typical calculation of the levels of illumination. See NYC Building Code Section 27-381.

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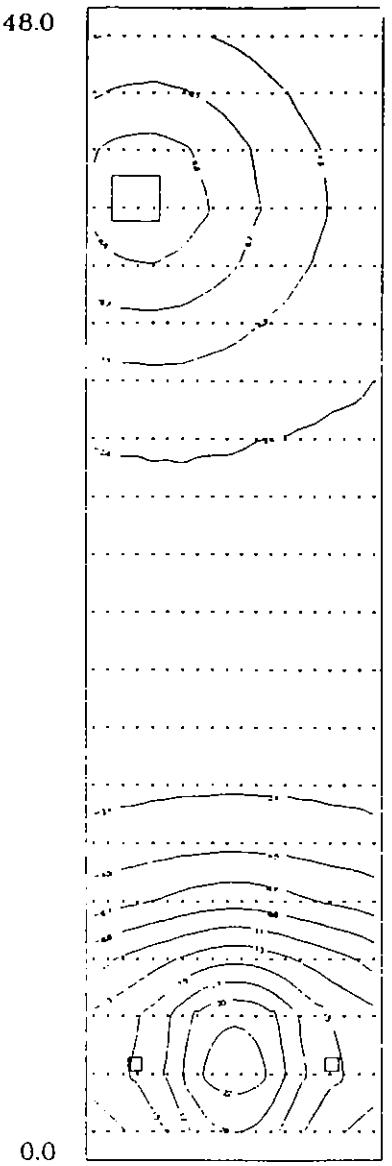
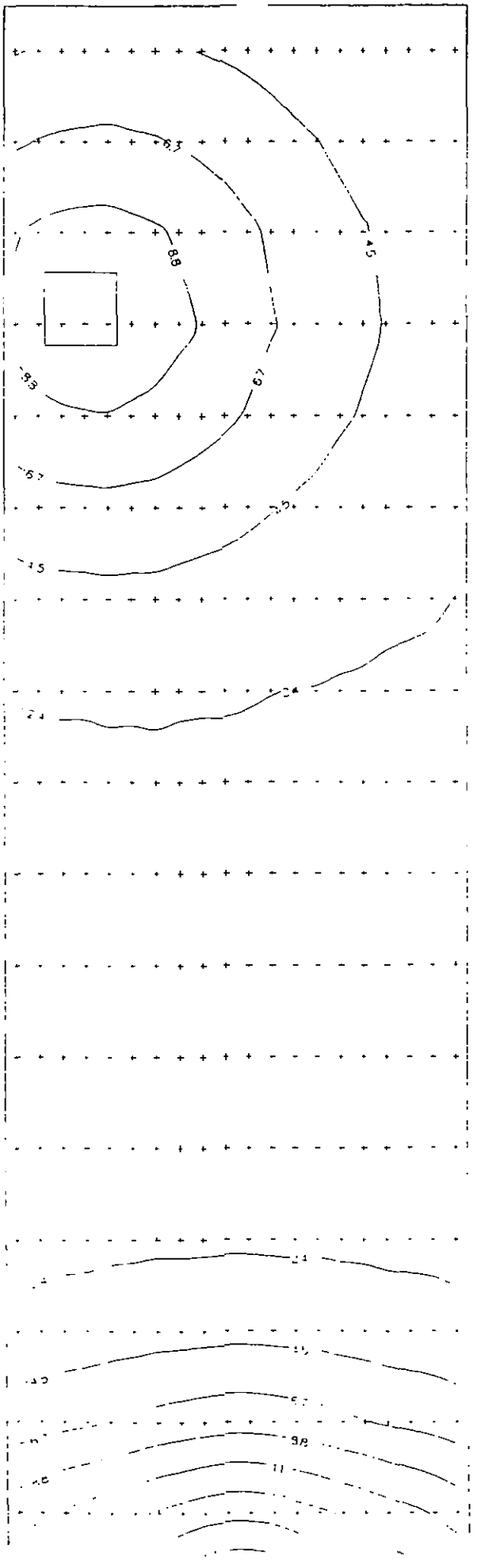


Surface: Grid 1
Design File: PA1
Units: footcandles

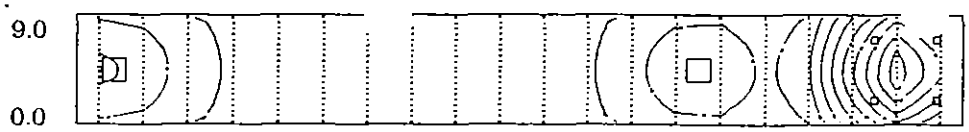
ELEVATOR LOBBY

FEM CONDITION

48.0



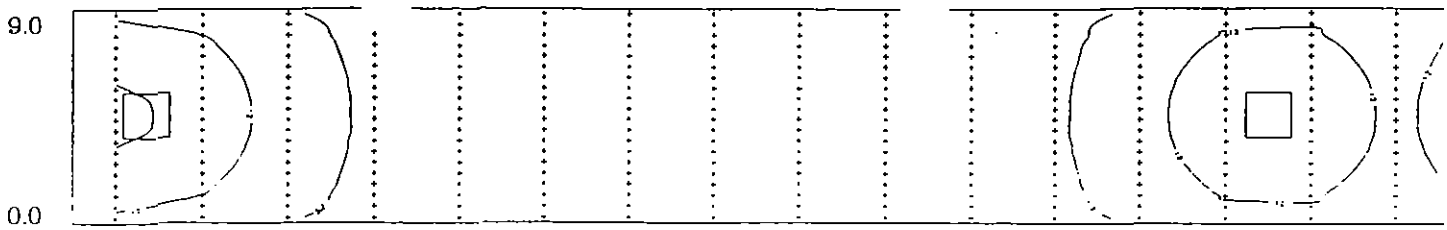
ELEVATOR LOBBY



Analysis: Horizontal Illuminance Scale: 0.065 = 1.00
Surface: Grid 1
Design File: PA2
Units: footcandles

Lumen Micro Version 6.0 Copyright (c) Lighting Technologies Inc. 1993

CORRIDOR



0.0

Analysis: Horizontal Illuminance Scale: 0.125 = 1.00

Surface: Grid 1

Design File: PA2

Units: footcandles

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CORRIDOR

Cosentini Associates
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DESIGN FILE: PA2.DES

CORRIDOR

ILLUMINANCE (footcandles)

WORKING PLANE HEIGHT: 2.50

AVERAGE: 12.9 MINIMUM: 2.07 MAXIMUM: 65.0 MEAN DEVIATION: 10.8

ABS. Y COOR.	ABSOLUTE X-COORDINATE(S)																				
	1.75	5.25	8.75	12.25	15.75	19.25	22.75	26.25	29.75	33.25	36.75	40.25	43.75	47.25	50.75	54.25	57.75	61.25	64.75	68.25
8.77 *	11.0	9.42	5.59	3.49	2.61	2.28	2.12	2.07	2.23	2.30	2.70	3.81	5.88	9.57	9.85	6.80	12.0	29.8	45.9	36.1
8.32 *	12.1	10.7	6.23	3.82	2.86	2.52	2.33	2.28	2.44	2.51	2.95	4.17	6.60	10.9	11.3	7.57	13.1	32.8	50.4	38.1
7.87 *	13.1	11.5	6.49	3.85	2.84	2.49	2.30	2.24	2.34	2.47	2.92	4.13	6.91	11.9	12.1	7.87	13.6	34.4	52.9	39.7
7.42 *	14.3	12.5	6.82	3.99	2.91	2.54	2.35	2.29	2.38	2.53	3.00	4.24	7.30	12.9	13.1	8.29	14.3	35.9	55.4	41.7
6.97 *	15.4	13.4	7.06	4.02	2.90	2.51	2.33	2.27	2.34	2.51	2.99	4.26	7.58	13.9	14.1	8.58	14.9	37.2	57.6	43.4
6.52 *	16.4	14.3	7.31	4.09	2.93	2.53	2.35	2.29	2.35	2.52	3.01	4.33	7.88	14.9	15.0	8.89	15.5	38.5	59.9	45.3
6.07 *	17.5	15.1	7.55	4.17	2.98	2.57	2.39	2.32	2.39	2.56	3.06	4.42	8.16	15.8	15.9	9.20	16.1	39.8	61.9	47.1
5.62 *	18.1	15.7	7.69	4.19	2.98	2.56	2.38	2.32	2.37	2.56	3.07	4.45	8.34	16.5	16.6	9.41	16.4	40.7	63.2	48.4
5.17 *	18.7	16.2	7.84	4.26	3.02	2.59	2.41	2.35	2.41	2.60	3.11	4.51	8.51	17.0	17.1	9.60	16.6	41.4	64.2	49.7
4.72 *	18.9	16.3	7.88	4.26	3.01	2.58	2.40	2.33	2.39	2.58	3.10	4.51	8.56	17.2	17.3	9.66	16.7	41.8	64.7	49.9
4.27 *	18.9	16.3	7.88	4.26	3.01	2.58	2.40	2.33	2.39	2.58	3.10	4.51	8.56	17.2	17.3	9.67	16.6	41.9	65.0	49.8
3.82 *	18.8	16.2	7.88	4.29	3.05	2.62	2.44	2.37	2.43	2.62	3.14	4.54	8.55	17.0	17.2	9.65	16.6	41.8	65.0	49.4
3.37 *	18.1	15.7	7.69	4.20	2.99	2.56	2.38	2.32	2.38	2.56	3.08	4.46	8.34	16.4	16.6	9.42	16.2	41.1	63.9	47.7
2.92 *	17.4	15.1	7.55	4.18	2.99	2.58	2.40	2.33	2.40	2.57	3.07	4.43	8.16	15.7	15.9	9.20	15.7	40.0	62.1	45.6
2.47 *	16.4	14.2	7.31	4.11	2.95	2.54	2.36	2.30	2.36	2.54	3.03	4.34	7.87	14.8	15.0	8.88	15.1	38.4	59.6	43.5
2.02 *	15.3	13.3	7.06	4.04	2.92	2.53	2.35	2.29	2.36	2.52	3.00	4.28	7.58	13.9	14.0	8.65	14.4	36.7	56.9	41.6
1.57 *	14.2	12.5	6.83	4.01	2.93	2.56	2.37	2.31	2.40	2.55	3.02	4.26	7.29	12.9	13.1	8.24	13.9	35.0	54.2	39.5
1.12 *	13.0	11.5	6.50	3.88	2.87	2.51	2.32	2.27	2.37	2.49	2.95	4.16	6.91	11.8	12.0	7.82	13.1	33.0	51.2	37.2
.67 *	12.0	10.5	6.24	3.86	2.89	2.56	2.36	2.31	2.48	2.54	2.98	4.21	6.60	10.9	11.1	7.50	12.5	30.9	47.8	34.9
.22 *	10.9	9.35	5.60	3.52	2.64	2.31	2.15	2.10	2.26	2.33	2.73	3.84	5.89	9.50	9.75	6.73	11.3	27.9	43.2	32.3

The City of New York

DEPARTMENT OF BUILDINGS

EXECUTIVE OFFICES
60 HUDSON STREET, NEW YORK, NY 10013

CHARLES M. SMITH, Jr., R.A., Commissioner
312-8100

January 20, 1987

TO: BOROUGH SUPERINTENDENTS

FROM: Charles M. Smith Jr., R.A.
Commssioner

SUBJECT: "EMERGENCY LIGHTING IN EXITS AND ACCESS FACILITIES"
(Supersedes memorandum of February 19, 1986)

Professional Societies and Industry have brought to our attention the difficulty in measuring the required illumination at the floor level because of incapability of instrumentation, and diversity of reflecting surfaces.

Therefore, the Departmental Memorandum dated February 19, 1986 is superseded as follows:

Illumination of at least two(2) foot candles measured at the floor level shall be maintained continuously in exits during occupancy as required by Section 27-381(a) [C26-605.1(a)]. Illumination in access facilities to such exits shall be not less than two(2) foot candles, average measured at 18 inches above the floor level which shall be maintained continuously during occupancy. However, the illumination shall not be less than that recommended in the I.E.S. Lighting Handbook 1981 Application Volume (Pages 2-45 and 2-46). Additionally the required illumination shall be remeasured if the reflective surfaces are changed.

A total of more than four(4) lights are required to be connected to an emergency power source or to storage battery equipment by Section 27-382 [C26-605.2(a)].

The following definitions shall apply:

The term "access facilities" shall mean a "corridor" or "public hallway" in multi-tenant floors; and in single tenant floors it shall mean the enclosed or unenclosed passage connecting the required floor exits and any passenger elevator serving floor to two required floor exits.

2/6/87

VLW
Please copy, duplicate & circulate to all MME member firms
R. Faherty

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY

M E M O R A N D U M

To: Mr. Lou Menno, General Manager, World Trade Tenant Services
From: C. John Lin, P.E.
Date: March 3, 1998
Subject: **WTC - ALTERATION APPLICATION W-981121 - PANYNJ - 1 WTC, 92ND FLOOR - CORRIDOR AND LOBBY UPGRADE**

Reference: Review Request dated 2/18/98

Copy To: A. Fadavi, G. Gaeta, D. Luey, T. O'Connor, J. Napolitano, Job Folder, Chrono Folder

A review of the material submitted with the referenced request has been made.

It is recommended that **approval** to proceed with construction be given subject to the **submission** of the items listed below being **revised** in accordance with the **seven (7) requirements** listed on the attached rider.

Drawings: Specifications:

REMARKS: 1) *See the attachment for a list of drawings recommended for* approval.

2) This memorandum was transmitted to the Facility via OA on March 3, 1998.

for C. John Lin, P.E.
Acting Manager
Quality Assurance Division

I.D.: W98-1121-001
SS/al
att.

Reviewers:
S. Sharma, Coordinator and Structural; D. Remeta, Architectural;
T. Santa Maria, Electrical; Z.A. Zwierz, Mechanical; D. Luey, Fire Protection.

RIDER

ALTERATION APPLICATION W-981121

ELECTRICAL

1. Drawing E192C. Five (5) 2'x2' emergency lighting fixtures are shown in the corridors, four (4) compact fluorescent downlights at the intersection of the corridors, and another four (4) at the Elevator Lobby. Please verify that in the event of failure of normal lighting, these arrangements of emergency lighting fixtures will provide at least 2 foot-candles of illumination measured at the floor level along the full length of the corridors at Elevator Lobby, at changes in direction and at the intersection of corridors. If calculations indicate inadequate levels of illumination at certain part(s) of the corridors and the Elevator Lobby, the design shall be revised accordingly. Please submit the photometric data for all emergency lighting fixtures, and other related information that were used in calculating/verifying the levels of illumination. Also, please submit a typical calculation of the levels of illumination. See NYC Building Code Section 27-381.

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W-981121 (cont'd)

FIRE PROTECTION

6. Drawing SP-102:

   a) Show all new and existing sprinkler piping and sizes in the area of work.

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030398

ATTACHMENT

ALTERATION APPLICATION W-981121

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M-1.00	dated	02/13/98
M-101	dated	02/13/98
M-102	dated	02/13/98

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY
ENGINEERING DEPARTMENT - DESIGN DIVISION TAA REVIEW REQUEST

To: D. LUEY (Reviewer) Location: 73 E

From: QAD DESIGN STANDARDS Date: 2/20/98

TAA # W98-1121-001 (Submission #) Facility: 1 WTC/92

Tenant: WTD Rec'd. Date: 2/18/98

Description of Work: CORRIDOR UPGRADE

Charge Code: W2-X-X-2.00.444

Review Disciplines

- ☐ Architectural
- ☐ Structural
- ☐ HVAC
- ☐ Plumbing
- ☐ Fire Protection/ Sprinklers/Etc.
- ☐ Electrical/Metering
- ☒ Utility> 600 V/ 5 KV
- ☐ Civil
- ☐ Geotechnical
- ☐ Environmental/Asbestos Abatem't.
- ☐ Fueling
- ☐ Radio Frequency Coordination
- ☐ Corrosion Protection
- ☐ Elevator/Escalator
- ☒ Traffic
- ☐ Other(specify)_____

Attachments

- ☐ Document List
- ☒ Contract Drawings
- ☒ Contract Specifications
- ☒ Tenant Response
- ☐ Calculations
- ☐ Catalog Cuts
- ☐ Reports
- ☐ Certifications
- ☐ Previous Rider
- ☐ Other (specify)_____

Special Instructions

Reviewer Information

Name_____
Date started _____
Date completed _____
Review time(days) ___
New comments ___
Repeat comments ___

DUE DATE: 2/26/98

Please notify the COORDINATOR if you cannot complete the review by the due date.

Please review the attached submittal; FAX and send your written comments to the following COORDINATOR:

Name: S. SHARMA Location: 51 N

Phone #:(212) 435-8613 FAX #: (212) 435-8555 *

* IF RESPONDING BY FAX, PLEASE ADVISE COORDINATOR IN ADVANCE AT TELEPHONE NUMBER INDICATED.

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY

TENANT ALTERATION APPLICATION REVIEW REQUEST

DISTRIBUTION		
No.	To	Facility
(4)	Quality Assur.	51N
(1)	E. Daly	88S
(1)	S. P. Chiao	88S
1	J. Napolitano	88S
(1)	J. Castaldo	2WTC 37
	P. Taylor	2WTC 37
(1)	D. Warren	PATC ZIP 43
1	C. SEMAN	2WTC 35

Facility 1 WTC 92nd FL TAA No. 981121 Date 2/18/98

Application / Tenant World Trade Center

Consultant Swanke - Hayden

Estimated Cost $ 130,000 Submittal No. 01

Description of Work

Corridor Upgrade

Please review the attached (revised) application and send comments to:

Name Sam Murray

Location 1 WTC, 88S Phone No 435-8240

3/4/98 DUE DATE

DESIGN DISCIPLINES

- [X] Architectural
- [ ] Egress Analysis
- [ ] Structural
- [X] HVAC
- [ ] Plumbing
- [X] Sprinklers
- [X] Electrical
- [ ] Utility > 600 V
- [ ] Civil
- [ ] Geotechnical
- [ ] Environmental
- [ ] Fueling
- [ ] Radio Freq. Coord.
- [ ] Corrosion Protection
- [ ] Elevator / Escalator
- [ ] Other

ATTACHMENTS

- [ ] Document List
- [ ] Contract Drawings
- [ ] Contract Specifications
- [ ] Tenant Response
- [ ] Computations
- [ ] Reports
- [ ] Catalog Cuts
- [ ] Other

DESCRIPTION

THE PORT AUTHORITY OF NY & NJ
QUALITY ASSURANCE DIV.
ENGINEERING DEPT.
FEB 18 1998
RECEIVED

NOTED:
REFERRED TO:
THE PORT AUTHORITY OF N.Y. & N.J.
ENGINEERING DEPT. QUALITY ASST. DIV.
DESIGN STANDARDS

FEB 18 1998
W98-1121 (1)
RECEIVED
ALTERATIONS APPLICATION
TENANT CONSTRUCTION REVIEW UNIT

Special Instructions

Copy To: G. GAETA, E. Daly, T. Lynch
E. Monteverde, N. Seliga
G. Melendez (Proj. Mgr)

Sam Murray
Signature

OFFICE COPY

J. Napolitano (w/2 sets)

PA 2127 / 5-94